The IRON AGE

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The Glare of Publicity

ONE of the shocking byproducts of every crisis in the affairs of men is the large number of curious proposals offered to cure the ills of the day. Nor do these always emanate from chronic crackpots. They are sometimes made by eminent scholars, by distinguished public servants, even, we regret to say, by successful businessmen—proponents who are entirely sane if not always sage.

A Princeton professor suggests the creation of an International Employment Stabilization Fund to prevent mass unemployment, with a capital of thirty to forty billion dollars. This institution would "lend at critical times to the most suitable applicants, *however poor credit risks they might be,* to the extent necessary to get its funds into operation." America, of course, will provide the bulk of the dollars. It is not surprising that an English bank—Lloyd's, with an eye on the critical British dollar shortage, should view this proposal with favor and publish the plan in its *Review.*

Henry Wallace, the self-designated answer to every liberal's prayer, says we should "approach the needs of the world from the standpoint of all humanity." He urges a program covering five to fifteen years, involving fifty to one hundred and fifty billion dollars to be spent for power, irrigation and development projects. This is an investment in postwar recovery, higher living standards, continuous prosperity and American security.

As a formula for winning friends and influencing people, the lavish broadcast of American money is at best debatable. At its worst it is a reprehensible dissipation of American substance. It tends to confirm a distressing misconception widely prevalent in other parts of the world that this country profited enormously from the war; that some outlet for our huge production must be assured beyond our borders in order to prevent a collapse of capitalism. The beneficiaries believe they are doing us a favor in accepting our aid. Because history is devoid of such inane largesse, the sophisticated and cynical European looks for an ulterior motive.

The proposal of a college professor, coming from the cloistered seclusion of an ivory tower, may be viewed with some tolerance. Similarly, the utterances of the great humanitarian, greeted by the resounding applause of the Communist Party, is subject to severe discount. However, when an elder statesman of the stature and antecedents of Bernard Baruch publicly urges that we guarantee the market of all nonperishable goods which the rest of the world may produce during a five year period, it constitutes a startling jolt.

Where on this globe of ours today is anything of value being produced which cannot be sold? What area, what group is suffering today because it cannot dispose of its product? Is it possible to find a spot where industry and labor are stalled because no market can be found for output? In those countries which today cause us greatest concern is recovery languishing because producers fear they cannot sell their goods?

At a time when the whole world is famished for food, material and finished products, we can think of no more inappropriate, gratuitous proposal than a five-year guarantee to absorb every nonperishable surplus. To warn Mahatma Gandhi against the evils, of over-eating, to provide him with a treatment for overweight makes just as much sense.

Joseph Stagg Lawrence

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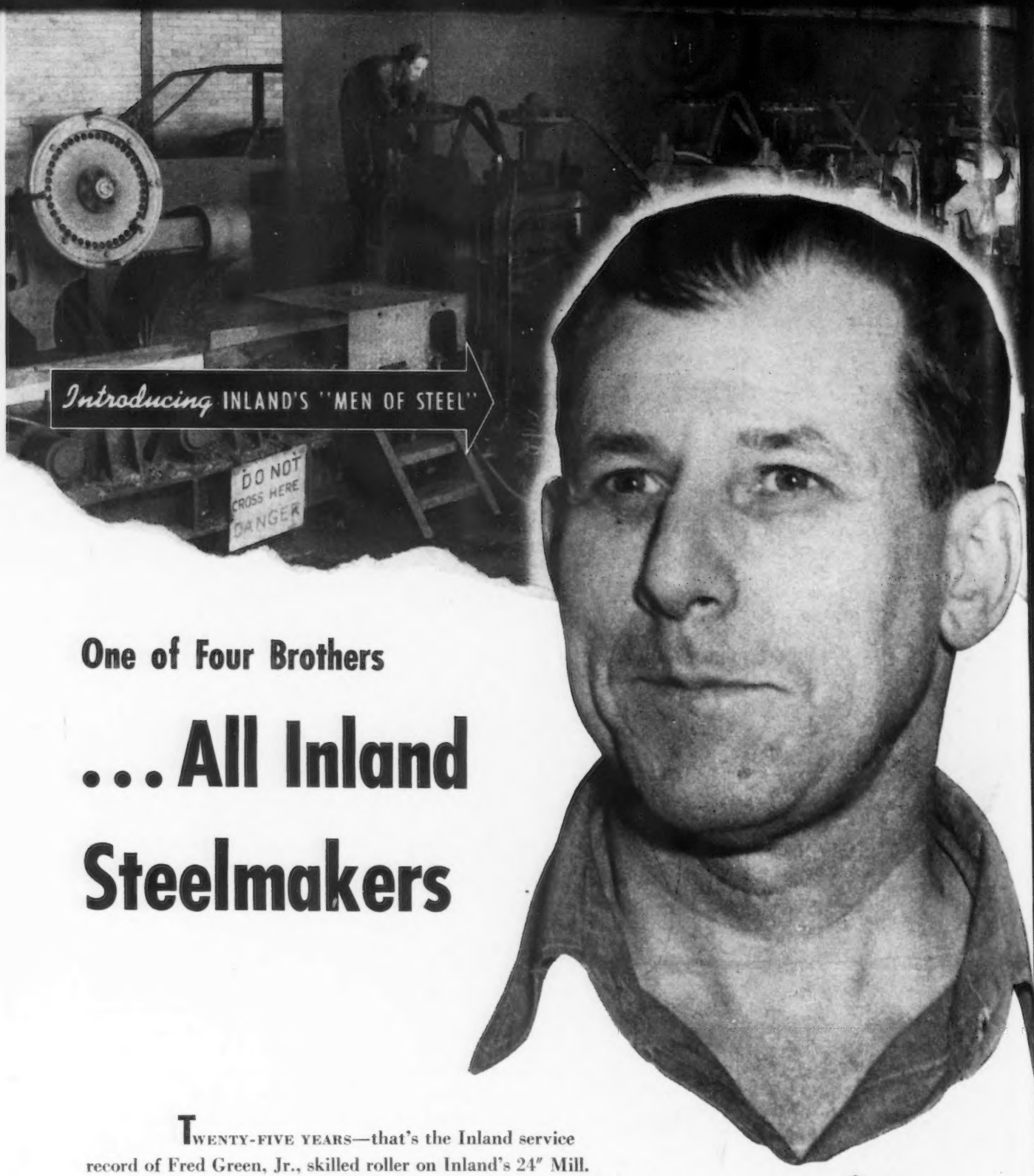

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TWENTY-FIVE YEARS—that's the Inland service record of Fred Green, Jr., skilled roller on Inland's 24" Mill.

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► An application of the combustion principles of jet propulsion has resulted in a jet heat warm air furnace for the home. The furnace is about one-half the size of a standard warm air gas-fired furnace.

► Metal has been making big dents in the canvas awning business since the war. Aluminum, which has been going nicely, now has another competitor. A stainless awning of spot welded tubular strut construction is now on the market following 2 years of development. Price tops that of aluminum but it isn't worrying the sponsors.

► Recent experimental work on adding oxygen to a cupola furnace has established that the enrichment of 5 pct of the blast volume appears to be the most suitable proportion of enrichment. Heats have been tapped at 3000° F under such conditions despite the fact that the charge contained an inferior grade of coke. Metering oxygen into the blast makes possible accurate temperature control of cupola furnaces.

► One argument that the ram-jet engine is superior to the rocket for war purposes is based on the fact that the ram-jet produces 25 hp per lb of weight compared with only 12 for the rocket, 3½ for the turbo-jet and one for the internal combustion engine. Fuel consumption is only a sixth as much for the ram-jet as for the rocket.

► Very successful field trials are reported for a recently developed all-aluminum truck wheel assembly. The wheel is a permanent mold casting, with the complete assembly weighing 135 lb, as against 190 lb for the cast steel counterpart.

► Design trends predicted for future marine propulsion turbines involve increased pressures and temperatures and rotative speeds. Increased feed heating will further improve thermal cycles, and application may be found for reheating of the main steam flow after partial expansion.

► Contrary to usual experience in efforts to reclaim electroplated zinc base die castings having a defective plate, an automobile producer recently successfully reclaimed 20,000 die cast grill parts having a defective plate.

The reclamation was accomplished by using a normal stripping operation, followed by immersion in a new type acid bath. Following treatment in this bath it was possible to put on a sound, copper, nickel, chrome plate. The bath used is said to have a phosphoric acid base and a pH value heavily on the acid side.

► The first centrifugal blower in this country to use a hydraulic coupling to transmit a maximum speed as high as 3600 rpm will be used as a booster to increase distributing capacity of manufactured gas. The coupling permits variable blower speed with a constant-speed 1750 hp motor.

► With fuel oil prices going up and up, and coal still a black diamond, it is no secret as to how much John L. Lewis will ask for in the third wage round. He will ask for all he hopes he can get---and some more. He remembers the Jacksonville agreement in the old days when the miners took a cut. Now when he has the upper hand he will drive for a hard bargain and he will get a good part of it.

► Continuous noncontact gaging of plastic, rubber, paper, metal foil, glass, linoleum and other sheet materials by use of an X-ray thickness gage, already used for steel sheet and strip measurements, is foreseen in the near future. The instrument will not scratch surfaces and it can control roll screwdowns for maintenance of uniform sheet thickness.

► It won't be long now until Washington will look like the good old CMP days. Commerce is now looking up the names of people to put on the detail job of the voluntary allocations setup. Steel companies will send some dollar a year men to Washington to look after steel interests.

► A smart Texan has built up a nice business with an elaborate rig he uses to pull casing from abandoned oil wells. Recently he has been seeking to dispose of several hundred tons of scrap casing a month to any mill that will sell him new pipe or casing.

► With gas supplies being cut in some areas, economy measures are being stressed by manufacturing plants. One steel producer has been drying scrap by placing the scrap bucket over slag thimbles rather than drying it with gas fires, and ladles are being dried out with covers over them, thus saving about 25 pct of the normal gas requirements.

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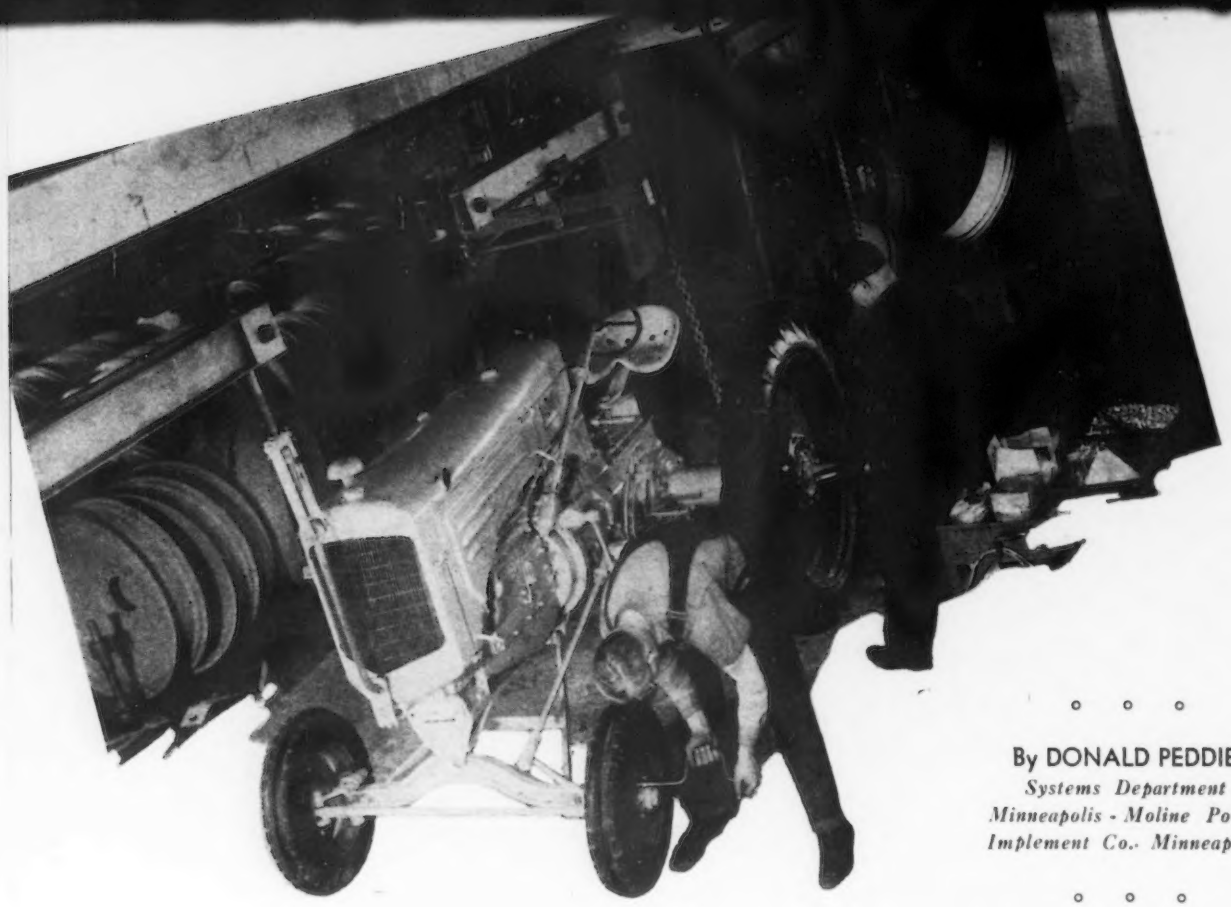

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By DONALD PEDDIE
Systems Department
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Use of effective yet flexible production controls methods is now acknowledged as imperative for the success of high quality, high production operations. This article describes in detail a highly effective control plan used by Minneapolis-Moline Power Implement Co. in the manufacture of farm tractors and power units.

WITH manufacturers' inventories soaring to all-time peaks, production control has come into its own as one of management's most important duties. Production control, stripped of production planning trappings, basically centers about the problem of inventory control. Production control work groups develop the detail of, and account for, the conversion of raw material and fabricated parts to finished products.

Production control has been loosely termed the coordination of materials, labor, tools and factory facilities, keeping in mind maximum output and minimum cost. But material is the thing! In most companies the largest investment is inventory, and one sure way to increase turnover ratios is improvement of material control.

Strictly speaking, production control is inseparably bound with material conversion and is only related to functions of machine design, tool design, time or output standards, quality standards, determination of manufacturing processes, and preparation of drawings, bills of material, etc. The latter belong to the extremely important production planning side of the family and will receive only passing attention in this discussion, although these items constitute a very large subject in themselves.

With so much responsibility allotted to production planning men, what is left for production control? Where does the need for production control arise?

Before describing the reasons for production control, it seems appropriate to define the product area to be covered here. A full line farm implement company such as Minneapolis-Moline can point to wide diversities of production and differences in the attendant production control problems. Comparatively small drills and plows are manufactured in different plants and under totally different conditions than tractors, power units and harvesters. In this article the production control techniques and procedures employed in the tractor and power unit plant only, the largest company producing unit, will be surveyed.

Now the question has become why production control in a tractor and power unit plant? Ingredients of the production mix in this plant are 20,000 different parts; required to assemble some 16 models of completed units. The parts vary

Production Control

. . . As Applied in a Farm Tractor Plant

in weight from ounces to hundreds of pounds. And there is considerable interchangeability of parts among different models. Almost half of the 20,000 parts are shop made and require machining on from 1 to 15 of the company's 500 major machine tools, with an average of 4 or 5 machines to each part.

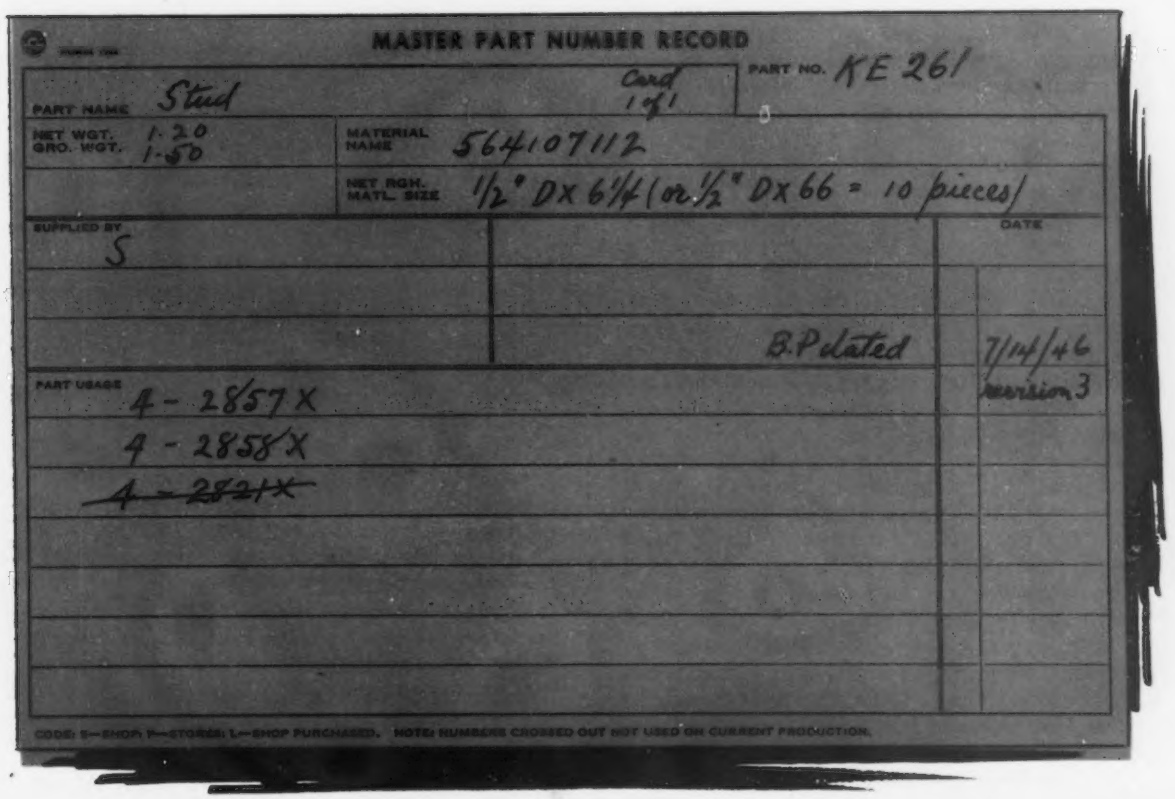
Operations are dependent upon each other. Many machine tools would often be idle if proper scheduling procedures were not followed in preceding departments. There also are interplant production relationships to recognize. In several important instances the advantages of centralizing a large volume of specialized work at one location with consequent economies of volume production have more than compensated for hauling or freight charges between plants.

There are still more factors which demand effective control. The task of integrating repair parts production with parts going for assembly line requirements is one of great complexity, involving economic production runs, collation of identical part numbers going to different end uses, etc. In the case of many production parts, however, storage facilities do not permit accumulations of more than two or three days of assembly line needs. Some bulky parts are even transported directly from last operation to the assembly line, so close is the timing which must be maintained. The heavy carrying costs of inventories are other factors which encourage close scheduling.

Engineering Records and Processes

Production control places great reliance upon the engineering department for fundamental

FIG. 1—Master part number record which indicates all bundles or assemblies on which any given part is used. Used in engineering, purchasing and production control.


MASTER PART NUMBER RECORD

PART NAME Stud — Card 1 of 1 — PART NO. KE 261

NET WGT. 1.20 GRO. WGT. 1.50 — MATERIAL NAME 564107112

NET RGH. MATL. SIZE 1/2" DX 6 1/4 (or 1/2" DX 66 = 10 pieces)

SUPPLIED BY		DATE
S		
	B. Related	7/14/46

PART USAGE

4 - 2857 X

4 - 2858 X

~~4 - 2821 X~~ version 3

CODE: S—SHOP; P—STORES; L—SHOP PURCHASED. NOTE: NUMBERS CROSSED OUT NOT USED ON CURRENT PRODUCTION.

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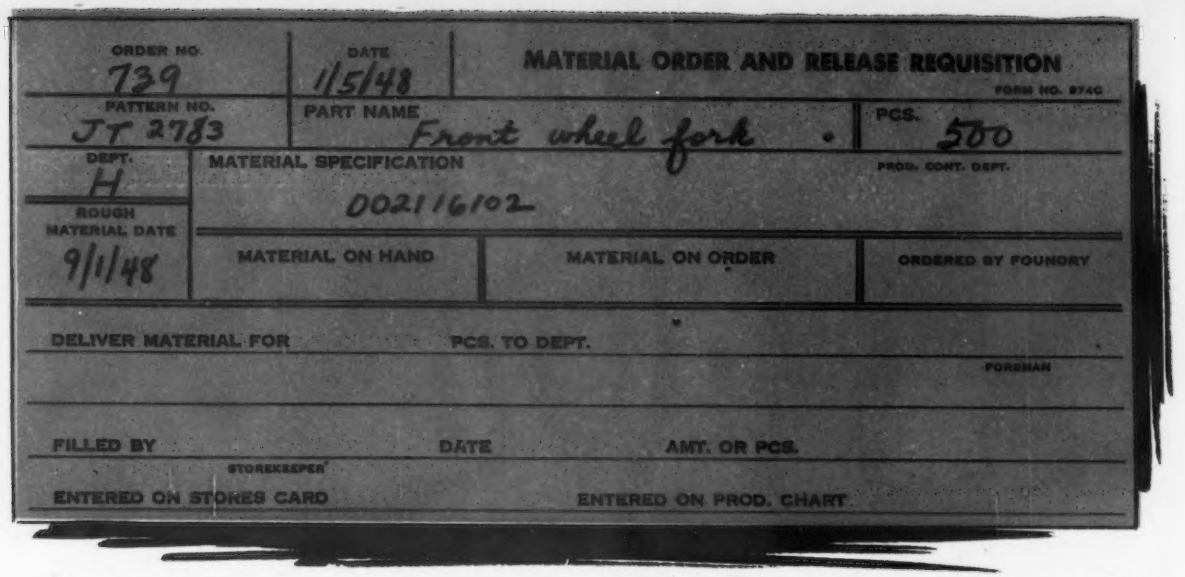

ORDER NO. 739	DATE 1/5/48	MATERIAL ORDER AND RELEASE REQUISITION FORM NO. 874C	
PATTERN NO. JT 2783	PART NAME Front wheel fork		PCS. 500
DEPT. H	MATERIAL SPECIFICATION 002116102		PROD. CONT. DEPT.
ROUGH MATERIAL DATE 9/1/48	MATERIAL ON HAND	MATERIAL ON ORDER	ORDERED BY FOUNDRY
DELIVER MATERIAL FOR	PCS. TO DEPT.		FOREMAN
FILLED BY STOREKEEPER	DATE	AMT. OR PCS.	
ENTERED ON STORES CARD		ENTERED ON PROD. CHART	

FIG. 2—Material order and release requisition which is prepared from bill of material as the first step in production scheduling and rough material requisitioning.

records. The basic catalog of parts required to make the product is called the *bill of material*, a detailed listing of component parts with the quantity of each for one unit.

Supplementing this basic document is the *master parts record* fig. 1, sometimes known as the where used file. This is a complete parts file in part number sequence which indicates the different assembly uses (often on different products) for each part. Material description is included on this record in the form of a nine digit numeric code. The amount of material required for one piece is also noted.

Company usage of raw material has been carefully scrutinized by a newly established standards committee, whose aim is to lower production costs and inventory carrying charges by reducing the types of raw material purchased.

A new and comprehensive parts numbering system is controlled by the engineering department. This ten digit alpha-numeric code tells an important story but does not become involved with variable circumstances relating to a part. Assemblies, built up composites and individual piece parts can be distinguished from one another; the appropriate plant is identified; interchangeable variations can be spotted. But what the part is made of, the products on which it is used, whether it is manufactured or purchased, etc., are not revealed. These things are subject to change, particularly as the company strives for greater interchangeability of parts between product models.

A *parts number register* is also maintained by the engineering department. New parts numbers are issued as required, gradually reducing the total of old numbers outstanding. Exceptions in the new system are the completely numeric General Motors coded parts, used whenever possible.

So-called labor layout or process sheets are supplied by the methods department, working in conjunction with the tool design department. In accordance with available facilities and best production practice, a sequence of operations known as the *layout* is assigned to the drawings of the mechanical engineering department. Time standards are established as soon as possible because the men are on a piecework basis together with a guaranteed minimum hourly wage.

Details of several other types of production control methods were given the following articles appearing in THE IRON AGE:

W. G. Thannert, "Production Control at Caterpillar," June 26, p. 40; July 10, 1947, p. 52.

T. A. McMullen & J. H. Quick, "Standard Systems—Vital Aid to Management," Dec. 26, 1946, p. 48.

R. A. Trumpis, "Production Control for Small Plants," July 25, 1946, p. 49.

J. A. Coltrin, "Putting Production Control to Work," May 16, 1946, p. 41.

The standard cost system is based upon two of these basic engineering records—the bill of material and the labor layout. Cost bills of materials are set up by product model and kept current. Proper sales forecasts are necessary in order to minimize costly program changes. In this discussion the primary concern is production control, but the importance of sales forecasting is great. It is usually complicated by the durable nature of farm machinery and equipment. Today, of course, the problem is less severe because of the huge demand for food the world over. Acute food shortages and high costs of labor make the farmer think along mechanization lines and make the manufacturer think about production capacity.

But some day the farmer might again be thinking in terms of how long he can defer purchases of new tractors or harvesters. The importance of realistic sales estimates will then be fully

recognized. Sales history, product usage, inventory levels, seasonal trends, weather conditions, cyclical fluctuations and competitive factors will be weighed carefully by the sales department.

Top company production, sales and purchasing executives formulate the manufacturing program for production control in the form of manufacturing authorizations. The latter are pieced together to become complete production assembly schedules by model. Present purchasing lead time requirements are such that the schedule must be maintained at all times as a 9 to 12 month projection.

Duties classified as exclusively production control may be put into the following major divisions: (1) Material scheduling and followup; (2) production scheduling and dispatching, and (3) stockkeeping. In addition, production control keeps a few miscellaneous records, some of which are tools for evaluation.

Material Scheduling and Followup

The overall production schedule must be broken down to individual parts requirements, both for the purchased and for the shop made parts. At present, this so-called bill of material explosion is accomplished by manual methods, but plans to convert this to a mechanical procedure are well developed.

Determination of quantities of material to order for shop made parts is obviously more complicated than determination of quantities of purchased parts required. Ascertaining material requirements involves setting scrap allowances based on past experiences as well as making several computations from feet to pounds, etc. Senior production clerks work from the bills of material and draw upon years of experience to determine the amounts of shop made parts to order, but leave the purchased parts explosion to the stores record keepers. A separate rough material section of stores records makes final computations for the shop made parts, converting the number of pieces required into sheets, pounds, or whatever the unit of measure may be.

The stores record section places all requisitions upon a central purchasing department, taking into account quantities on hand, minimum runs, etc. Purchase commitments are usually limited to and governed by definite assembly requirements for specific production lots, but deviations are permitted when necessary to obtain substantial purchasing benefits.

The stores record ledger card with its perpetual inventory has become indispensable. Receivings, withdrawals, orders, reservations, and results of the annual physical inventory are recorded immediately after occurrence. Entries are made for each production lot covered by the assembly schedule. The stores record department, of course, must approve all material releases for scheduling and production.

Placing the requisitions with the purchasing department does not relieve stores record personnel of all further responsibility. Followup is under the jurisdiction of the purchasing department assisted by stores record and senior production clerks. The latter are constantly reviewing the material situation with assembly schedules and are working in close cooperation with purchasing men. Efforts are made not only

FIG. 3—Production stock record which helps provide close control over shop-made parts inventory.

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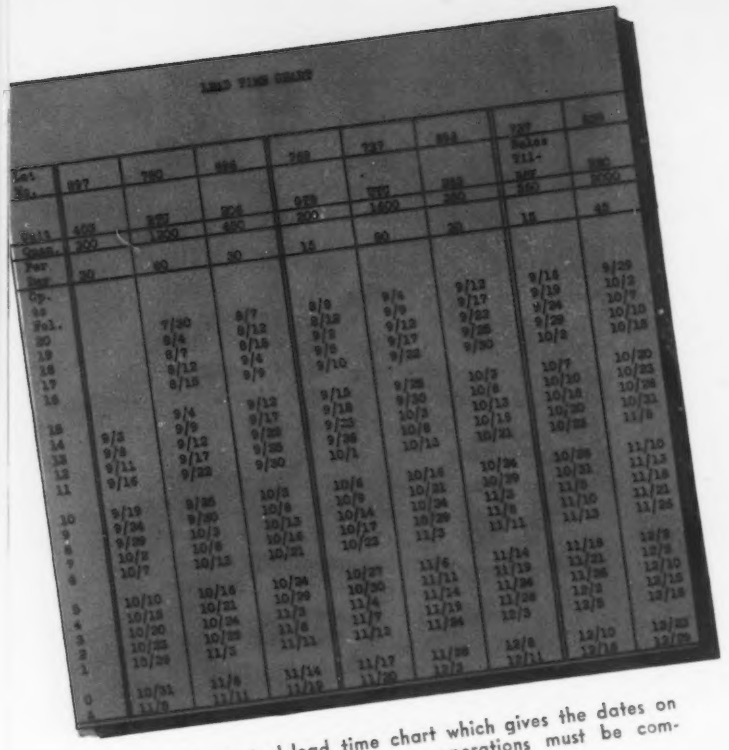

FIG. 4—Typical lead time chart which gives the dates on which specific manufacturing operations must be completed.

to obtain scheduled deliveries but also to prevent excessive deliveries ahead of time.

Material release and requisitions, fig. 2, commonly known as shop orders, are originally prepared by senior production clerks for each production lot and forwarded to the rough material unit of stores records to become the basis for establishing requirements. As soon as material is available, these so-called shop orders are returned to the senior production clerks for timely release to the departments performing the first operation.

Before such release can be made, however, two important clearances are required. The record of the completed bank of all shop made parts, as indicated in production stock record, fig. 3, must be checked to ascertain whether or not there has been a surplus on prior runs sufficient to obviate the need for a portion of this run. The second clearance required is from the central scheduling unit, which has the authority to alter production runs in accordance with the machine load situation. This unit actually controls the release of material to the shop.

Using these shop orders, the scheduling unit establishes a very simple but effective control of all production in the shop. A special lead time chart, a schedule card, and a series of visible index files produce detailed production scheduling on a large scale basis and of a very flexible nature. Flexibility is acquired in that machine scheduling decisions are made at the operating level; overall control is acquired inasmuch as final assembly schedules guide all decisions.

The lead time chart, shown in fig. 4, is prepared monthly with each active production lot, its quantity and its assembly rate listed horizontally across the top of the page. At the very bottom of the page will be found the starting assembly date for each lot—11/5, 11/11, 11/19, etc. The keys to the functioning of this system are *operations to follow* and the appropriate due dates, or more simply the dates by which specific operations must be completed because of subsequent work on the same part. Operations to follow are listed vertically on the left side of the chart.

As previously stated, the day upon which assembly is to begin for a given lot is written opposite the letter A under operations to follow. The number O is next entered on the chart, and moving horizontally across the chart it will be seen that there is established the date by which final operations on the labor layout (i.e. zero operations to follow) should be completed for all shop made parts required on one given lot. In each case three working days are allowed for purposes of establishing due dates. Working backwards still further, A day minus six days calls for the number 1 to be added to the vertical column. These are dates by which specific work should be completed on parts requiring but *one additional* operation from that point.

In short, this is a single lead time chart to apply to all production. Three days has been selected as a working figure; it is an important assumption and one which could vary from plant to plant. On some machining operations three days is a generous time allowance. On others it is insufficient. But in three days' time it is invariably possible to get a machine tool well started on its run and in a position to keep suboperations supplied. The exceptions to the three day system can be accorded special treatment, such as a red colored schedule card.

The maximum number of operations performed on any shop made part for tractors and power units is 21; 20, therefore, becomes the top limit of operations to follow.

Operations to follow tie-in information is supplied on the schedule card, one of which is prepared in central production control for each operation to be performed in the shop. Daily production by shift is posted to this card by the dispatcher. After the completion of one operation, the appropriate card is returned to central production control as a credit to machine load.

The total number of operations to follow is apparent from the labor layout and is noted on every schedule ticket (see fig. 5). All that remains on any given day is to match the total of operations to follow with the prepared lead time chart. The foreman can quickly determine whether his assigned work on an individual part is behind schedule, need not be run yet, or what preference it should receive in comparison with other active lots in the shop.

Schedule cards constitute the advance load file placed with a foreman. He and his assistants constantly review this file to obtain appropriate work. When a job is soon to be run, its schedule ticket is taken from the advance load file and placed in a visible index file. The cards in the left hand position in this file represent the work being performed at the moment.

The lead time charts can be revised very eas-

ily, but this is usually not necessary within one month. In any event, this system is far simpler than the former plan of individual schedule tickets for each part and places the detailed responsibility where it belongs—on the foreman in his own department.

Inventories of shop made parts, especially the bulky ones, are kept at a very low level. Schedule dates must be met on such parts or assembly lines will shut down. Consequently, the scheduling system is supplemented by the efforts of senior production clerks with their production charts. Final responsibility for the assembly of scheduled production lots is vested in these men. Up-to-date records of each part in process are obtained. This is another manual posting process soon to be mechanized. In addition to double checking the scheduling system, the work-in-process record books indicate (by part number on the production lots) pieces produced per shift, scrap, move orders, etc.

The schedule card is also a basic tool in the machine load system. Debits and credits to the load on similar groups of machine tools in each department are posted from schedule cards returned to central production control. These records serve as the basis for monthly load reports with accompanying analyses of present and future manpower requirements. Decisions to work certain machines the full three instead of the prevailing two shifts, to subcontract certain machinery operations, or even to modify the production schedule may result from these reports.

Machine tools have a special numbering system by which different buildings and departments are distinguished and similar machines in different departments can be easily recognized. The first three digits indicate the type of machine—turret lathe, post drill, etc. And within each department each machine has a specific number or group letter. A specific number is applied if any labor layouts call for only that particular machine and no other of even the same general type. A group letter is used where two or more machines are interchangeable as to capabilities, abilities to hold tolerances, etc.

Up to this point the discussion of production scheduling has largely centered about the central production control department; but now in an examination of dispatching methods, a shift is made to the departmental level. Each major department has a production control clerk who assists the foreman in scheduling the work, obtaining material and coordinating with other departments. He also records production by shift on the schedule cards, returning completed cards to central production control. He is responsible to the head of the scheduling unit in central production control and does not have any job ticket or timekeeping duties.

The stock section is divided into two units, rough stock and finished stock. These units are under the supervision of the production control manager and are responsible for receiving, storing, protecting and disbursing stock delivered to them via central receiving. The rough stock section also includes the saws used to cut material to length.

Central receiving is the starting point for inspection, chemical analysis, etc., and works closely with the stores record chief. The latter is in a good position to watch over central receiving activities on behalf of the production control and plant managers.

Other Functions

Responsibility for accurate physical inventories taken once a year lies with the production control department. Inventory taking requires two weeks and necessitates complete shutdown of production.

Production control prepares initial time tickets in accordance with labor layouts, but completion of information required on time tickets, variation reports and scrap tickets are all handled by the timekeepers in the shop. They are responsible ultimately to the factory manager. The production control department works closely with the cost and budgetary control departments in an effort to analyze unfavorable conditions presented in variation and scrap reports and in the monthly indirect labor and material budgets.

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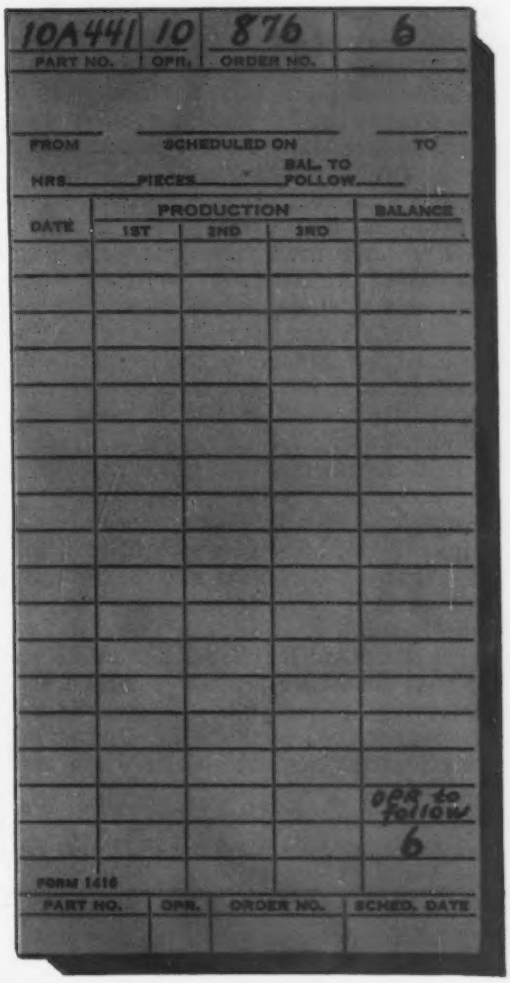
FIG. 5—Schedule card indicating number of operations to follow, which is reference number to be applied to lead time chart for determining scheduled completion dates.



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The Extrusion Molding Process . . .

The first description of the extrusion molding process, with particular emphasis on its development and application, and its potentialities as a production medium for gas turbine parts, is presented in this article. In introducing this new process, the author examines and evaluates various other metal shaping techniques in an interesting, albeit rather controversial, comparison with the extrusion molding.

THE extrusion molding process[1] is essentially a hot work method for the fabrication of metals and other materials into nearly finished articles. The parts produced by the process are called molded extrusions.[2] The name was derived from the functions of the process which combines two methods, although the operation is continuous and progressive.

First, the material is extruded through an orifice into a cavity cut in a mold. Extrusion is done at a temperature above the hot short range but below the solidus temperature.

Second, in the continuous operation, the material which has been extruded and changed by heat and pressure into a mushy plastic is molded to the shape of the cavity.

Extrusion moldings are in all cases made from metal in crude form, either ingot melted and held in a pot for transfer to the machine where it is allowed to freeze slightly before extrusion or a special cast ingot induction heated to the proper temperature for extrusion. Forged bar stock cut to length has been processed, but the slight increase in physical properties over the special cast ingot does not warrant the added cost. Centrifugally cast ingot gives the finest type of results when it is processed into molded extrusions although it is rarely necessary to resort to this method.

The art of making continuous extruded shapes is very old. The newer process, extrusion molding, incorporates principles that remove the crude undeveloped features, eliminate the disadvantages of straight extrusions and still keep the desirable characteristics. Besides molding irregular shapes that are not continuous, the new method has the advantage of pulling cores. Bosses and flanges can be produced without setting up internal stresses, slip planes or concentrated grain flow. Designers need not worry about cross grain values when designing parts made by this new method.

Molded extrusions have comparable physical and mechanical properties to those of the same material when forged. Their accuracy is more uniform than diecastings. Heat treat results are excellent and x-ray control can be established to higher standards than by other fabrication methods.

Molded extrusions have unique metallurgical characteristics which are typical only of the extrusion molding process. When once production is established, the controls of the extrusion molding machine make the repetition of the operation cycle very uniform. Parts are therefore identical, particularly when induction heating equipment is employed.

The extrusion molding machine (shown in figs. 1 and 2), has four different hydraulic pressures, all of which are variable to meet operating requirements. Three separate pumping systems are required. The major pressure is derived from a weighted accumulator which weighs 85,000 lb (visible on the right in fig. 3). This accumulator delivers hydraulic line pressures variable up to and above 12,000 psi to both ends of the machine. There are no relief valves or shock alleviators in the piping circuit for the accumulator. By controlling the speed of the fall of the accumulator the molding pressure input as well as the input pressure delivered for extrusion can be varied. Extrusion, or the speed of the metal traveling through the hot working or extrusion orifice, is also controllable by adjusting the fall of the accumulator.

No attempt has been made to establish the pressure per square inch on the metal as it passes through the small diameter of the orifice. Quite often more than 1,500,000 lb of force is employed.

[1] *Covered by U. S. patent 2,356,338; other patents pending.*

[2] *Covered by U. S. patent 2,345,338; trade name registered.*

BY H. B. COOK, from the Research Records of CHARLES C. MISFELDT

• • •

The fact that the metal is being hot worked and is flowing into the cavity of the mold makes the actual orifice pressure difficult either to estimate or check.

Low pressure hydraulic systems are used for opening and closing the die (fig. 4) and for pilot pressure as well as for filtering the hydraulic fluid to remove all of the air that may become mixed with it. Hydraulic fluid must be used that is as near to being noncompressible as is possible. The fluid must be such as to avoid losing the effect of the molding shock pressure which is derived from the force generated by the falling weight. In foot-pounds this theoretical pressure on an 85,000-lb weight, falling 10 ft, is 850,000 ft-lb. When accelerated by the use of the free fall control, the pressures may run considerably higher. The free fall control is used to bring about an increase in pressure at a variable point in the fall of the accumulator to intensify the molding pressure. At times, for the satisfactory hot working of some difficult alloys, the extrusion piston must be controlled to a speed of travel which reduces the molding pressure below extrusion requirements alone.

The orifice through which the metal is extruded or hot worked is a constricted shape developed empirically and may require a change for each type of alloy and for each type of mold and for each extrusion speed. However, this shape is somewhat similar to the actual shape of the flow lines indicated on etched butts taken from conventional extrusion presses. This point was compared after hundreds of orifice shapes had been made and tested to determine which contour and which proportion of reduction gave the best

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physical properties. Purposely, the comparison was avoided until an empirical formula could be developed to be sure maximum results were obtained. The butt from a conventional extrusion billet was cut in half and macroetched to compare its flow contours with the shape established for the best results in an orifice of predetermined shape for handling metal at extrusion molding temperature.

The action of the orifice is to break down or plasticize the metal by reduction in area caused by its flow through the constricted area. Because of the pressure and compression of the metal, heat is generated which causes the metal to be uniformly refined and have a fine grained mushy plastic consistency. The mushy plastic must *not* contain liquidus material to the extent that it would cause segregation when molded. By having too great a reduction in the orifice, or the wrong contour, or too fast an extrusion speed the metal may overheat and become partly liquid. This causes not only segregation, but actual burning which results in a cavity full of oxidized or burned metal.

Each part requires a careful study to establish the technique to be employed and because fundamental principles have been established and engineering design has been incorporated into the technique of every type of part thus far made, precedence has been established. It is possible, by using the mold designs already proved, to design molds for the most complicated type of parts that are within the scope of the process.

For example, the difficulties to be encountered in making a tapered wing spar 40 ft long with bosses and attachment fittings present the same kind of mold problems, except for size, as a 30-in. machine gun barrel which has the hole cored ready for the rifling operation. The mold must be sufficiently strong to withstand the ramming pressure created at the molding cycle. It must be held at a temperature to permit the metal to flow in the proper plastic condition. The mold must be filled at the proper point as taught by experience. With such a mold design it is a matter of mechanics, or having a machine of sufficient capacity to handle the metal for filling the mold in accordance with the range of practice established for the general type of part.

Fig. 3 illustrates the first experimental machine used for the research to develop the principles involved in the design of the large machine shown in figs. 1 and 2. Details were so well established from production work on the experimental equipment that the machine functioned satisfactorily on its first job some years ago in California. Such details or dimensions as had been overlooked by the machine shops in working to engineering drawings were the only requirements for a production unit.

Parts made from many types of alloys, including most all standard nonferrous alloys and others such as magnesium beryllium, aluminum beryllium, copper-beryllium-nickel and beryllium copper, are shown in fig. 6. The parts vary from machine gun barrels to bomb rack hous-

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FIG. 1 — View of the extrusion molding machine.

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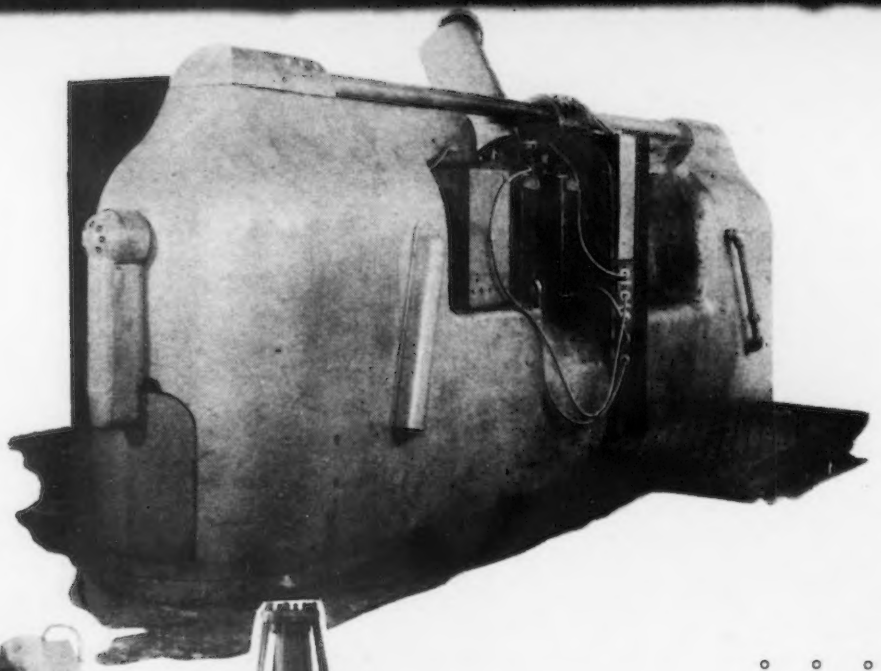

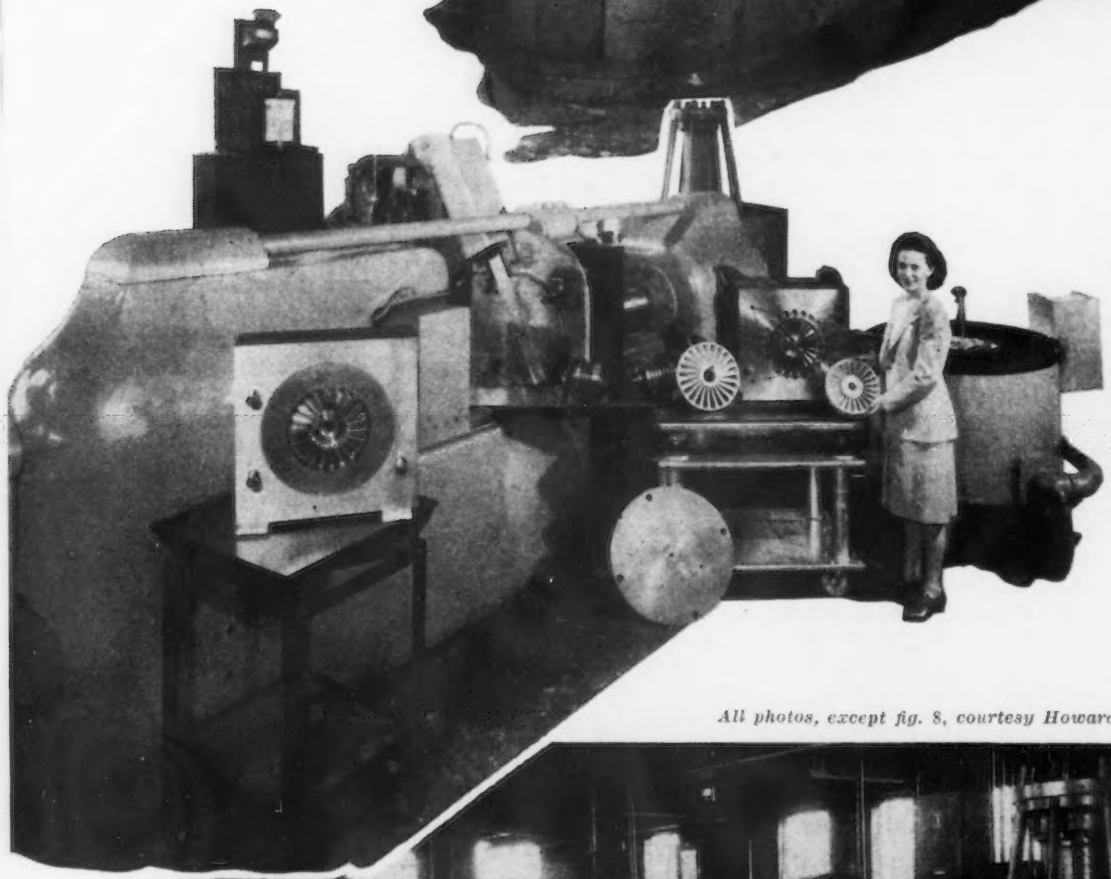

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FIG. 2 — Another view of the extrusion molding machine showing the dies used to produce one-piece shrouded turbine wheels. The sprue cutter mounted in the machine is also visible. The superstructure rising above the top right section of the machine is the upper section of the accumulator.

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All photos, except fig. 8, courtesy Howard Foundry Co., Chicago.

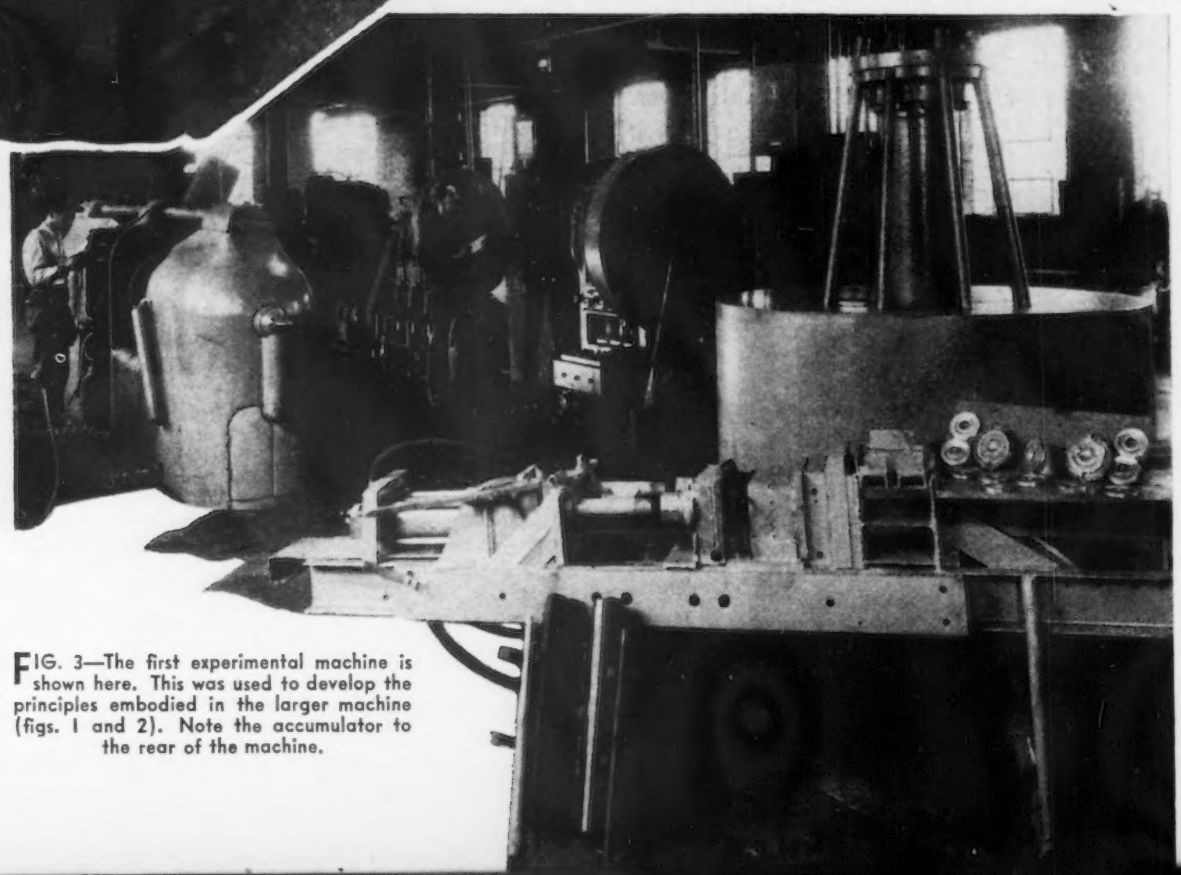
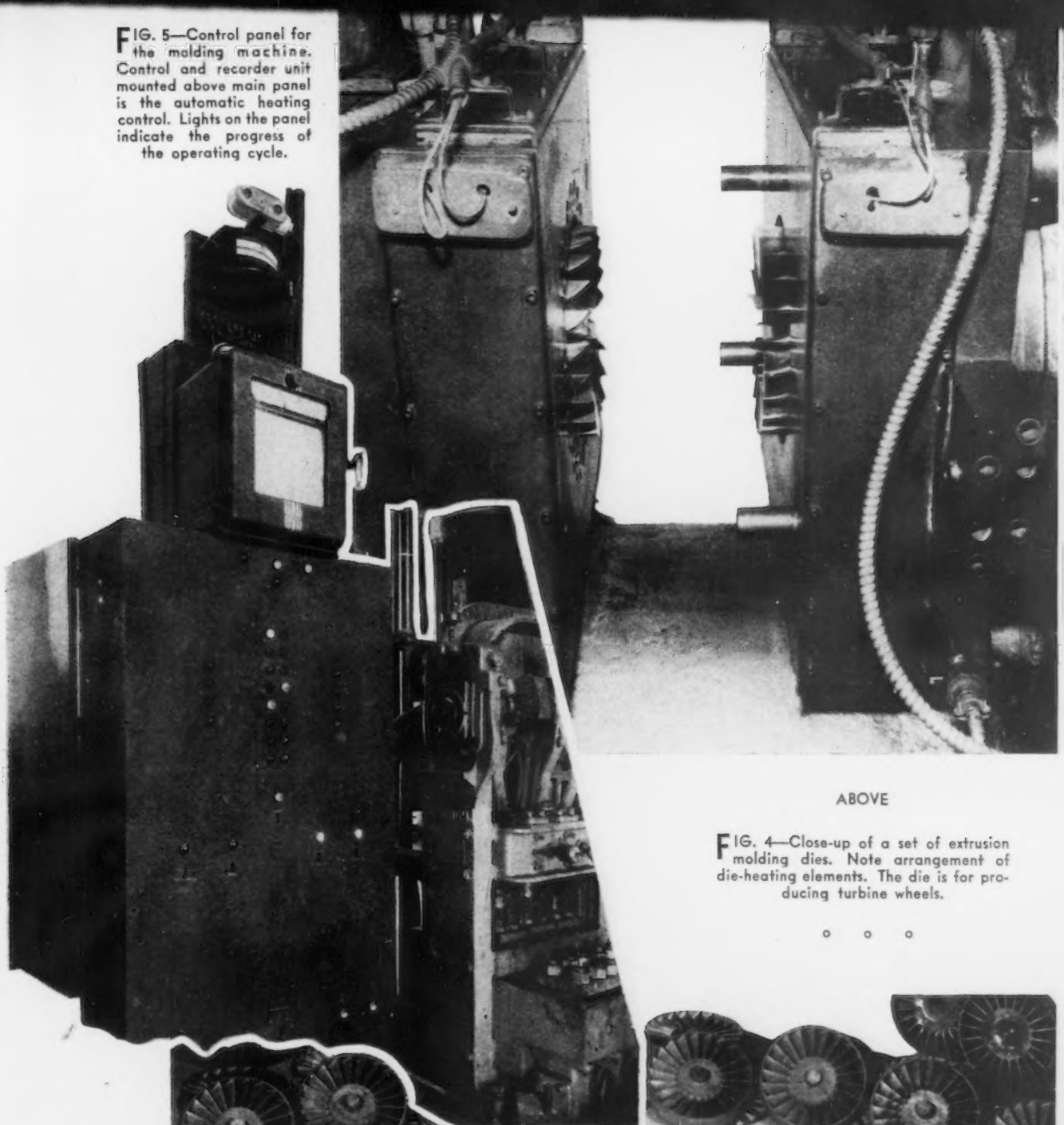


FIG. 3—The first experimental machine is shown here. This was used to develop the principles embodied in the larger machine (figs. 1 and 2). Note the accumulator to the rear of the machine.

FIG. 5—Control panel for the molding machine. Control and recorder unit mounted above main panel is the automatic heating control. Lights on the panel indicate the progress of the operating cycle.



ABOVE

FIG. 4—Close-up of a set of extrusion molding dies. Note arrangement of die-heating elements. The die is for producing turbine wheels.

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RIGHT

FIG. 6 — Typical molded extrusions in various alloys. The parts range from machine gun barrels and bomb rack housings to turbine rotors.

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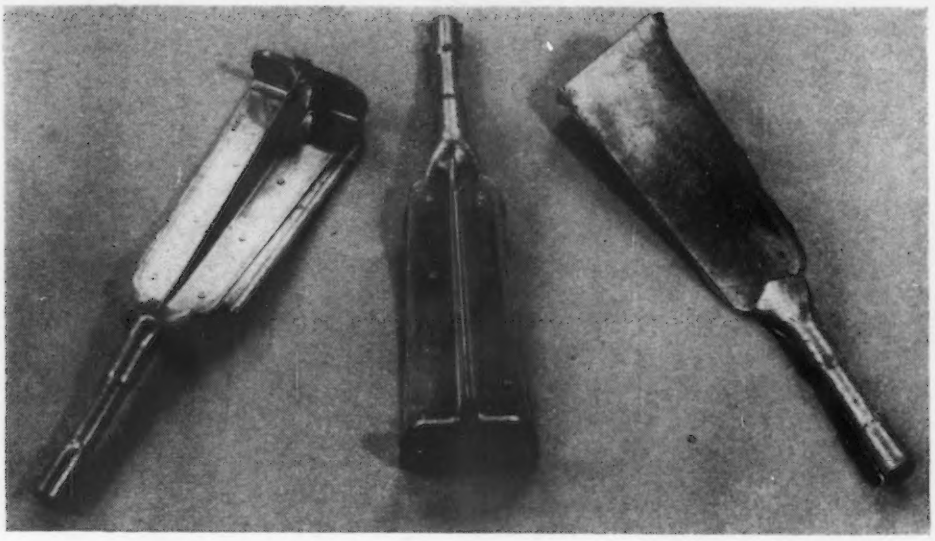

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FIG. 7 — Cowling bracket extrusion molded with a subsize test bar produced integral with the part.

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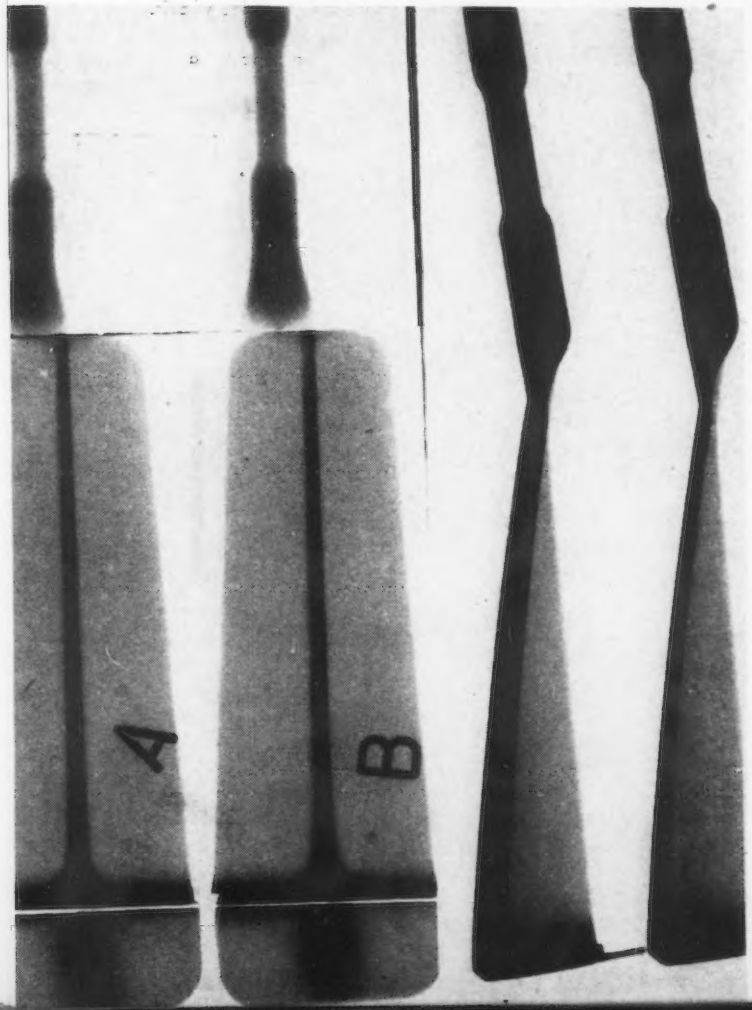
ings. The fan-type part in the background is a turbine rotor for an aircraft engine supercharger, which passed the same spin test required for a part machined from a forged billet that cost several thousand dollars each as machined.

The type of parts placed into production has been purposely restricted to types that have broadened the application of technical experience with the process and therefore has established the scope of the method. With this work now completed the extrusion molding process has established its field of application.

FIG. 8—X-ograph view of the cowling and test bar shown in fig. 7. Photo courtesy Warner Mfg. Co., Glendale, Cailf.



In this connection, it is interesting to note that if all of the castings used on any airplane could be redesigned to make use of the maximum physical and mechanical properties possible for the part as fabricated by the extrusion molding process, the total weight of the parts now cast would be approximately a third of their present weight even though made from the same alloy. It would be necessary, however, to proof-test each of the types of parts to satisfy the specifications group at Wright Field due to the fact that design allowables for extruded molded parts have not all been set up.

Extrusion molding was perfected early in the war when high production was essential and the need for methods of manufacturing parts became apparent. Long experience in the aircraft industry, where progress in engineering design is dependent upon the use of strong and light materials, created the incentive to develop a more efficient manufacturing process to obtain higher physical and mechanical properties. The elimination of excessive manhours was also a factor. A method was needed that would satisfactorily fabricate parts from all types of alloys to meet aircraft requirements. Such a method was needed to give the aircraft engineer more to work with in the way of materials and more freedom in design.

At that time an analysis of all types of fabrication methods were made in the search of a better process. Conventional methods had definite limitations, some of which were objectionable in the alloys and parts needed for aircraft work. Forgings give dependable properties but are limited to certain forgeable alloys which may not have all the characteristics required by designers. For example, alloys that have the best properties at elevated temperatures are not always forgeable. It is not practical to pull cores in forging. Shapes are limited and draft angles and tolerances require considerable subsequent machining. Forgings must be designed so that the load will not run cross grain. Usually some warpage takes place during heat treatment or

later machining operations, which slows down production and increases costs.

In analyzing the then known methods of making aircraft parts, the following conclusions were reached. These findings also hold true today.

Conventional extrusions or straight continuous shapes are limited to a small range of alloys. However, extrusions offer excellent section design where they can be used and they are adaptable for bending and some machining. On large thick extruded sections, when too much is machined away, strength is reduced to an amount not much superior to a good casting. All designers using machined extrusions should require proof test of each part after machining. Conventional methods of application which are limited to continuous shapes are usually not flexible enough for general design purposes.

Impact extrusions are also limited to certain alloys. Shapes or combinations of shapes to which they can be formed are limited due to the characteristics of metal flow. Often metallurgical results not desirable result in such parts because of their variations in section. Again, parts so made should be well proof-tested to determine if the design is such that good mechanical properties are not the primary requisite.

Plaster or precision castings are useful for small parts in production, but again these parts are limited and the properties are only equal to a good casting. Further, they are expensive and not as uniform dimensionally as the name would imply.

Centrifugal casting methods are very limited although they have great possibilities where arrangements can be made to set up jobs for high production. Physical and mechanical properties from heavy material centrifugally cast indicate results better than good sand castings of the same material. Tendencies on heavy materials in centrifugal casting technique seem to lean toward "giving the metal a ride" while it is freezing, rather than actual centrifugal casting, which requires greater speeds than have been used. Experimental work undertaken to establish limits and physical property characteristics of aluminum and magnesium, as centrifugally cast, shows very high casting speeds are required to get uniform dependable properties. Dry sand molds developed to date are not strong enough to withstand the necessary high speed needed for true centrifugal casting.

Sand castings provide a wider range of usable alloys but low and variable physicals obtained in such parts add a penalty in weight. In addition, the allowable stress permitted for design purposes causes such castings to be heavier than aircraft manufacturers would like to use. They are not uniform dimensionally, warp in heat treatment, require many machine shop manhours.

Permanent mold castings provide some additional physical properties and save considerable in machine manhours. Dimensionally they are quite uniform but could not be considered as an answer to the aircraft engineering problem because of the penalty in allowable stresses and the restricted number of alloys that can be permanent mold cast. Permanent mold cast properties do not approach the properties of forgings.

Diecastings were strongly recommended for aircraft production and were used in great quantities. Thus, limits for the diecasting method were soon set up, based on aircraft experience with diecastings. Allowable stress factors were established for their use which made them unsatisfactory for structures and added a weight

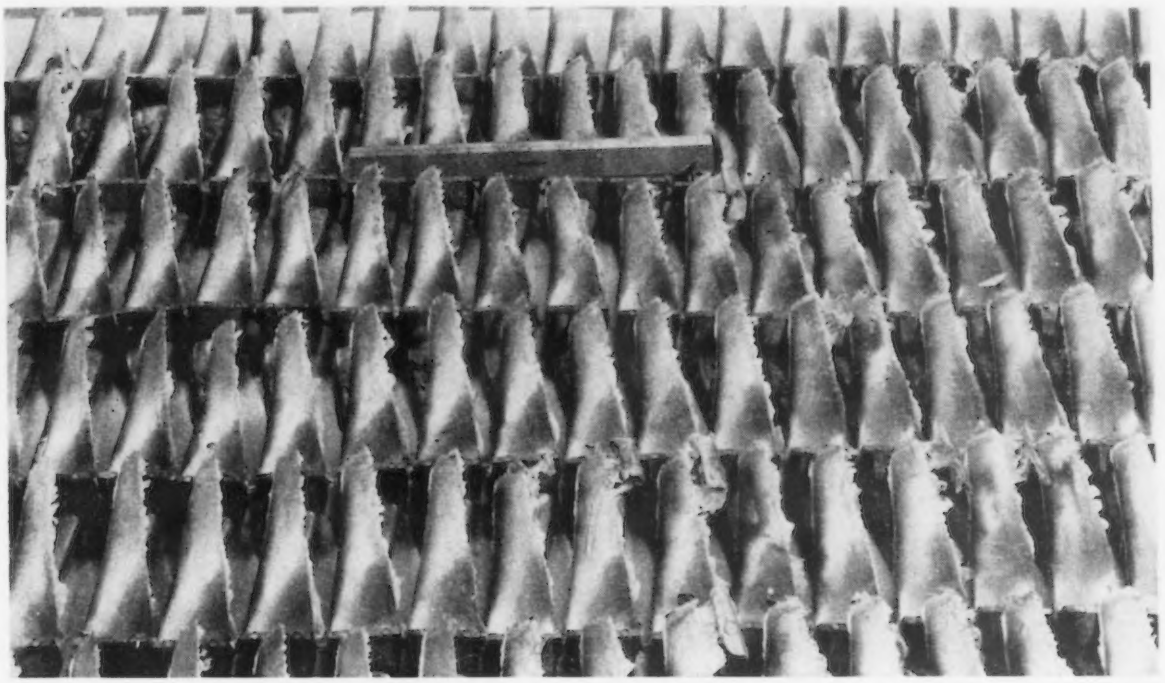


FIG. 9—Gas turbine blades with a trailing edge 0.007 in. thick produced by the extrusion molding process. The alloy is a 3 pct Be-Mg-Al type.

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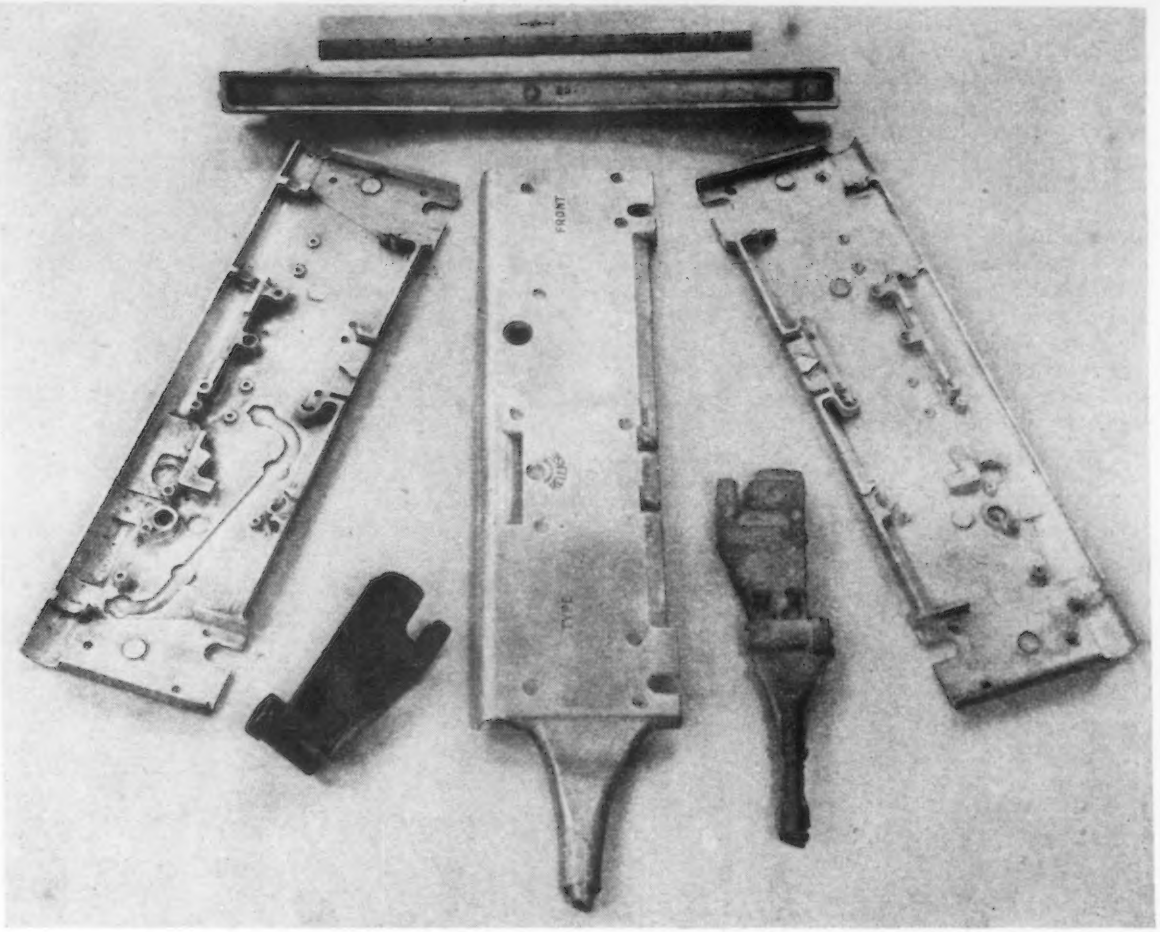


FIG. 10—A group of bomb rack parts produced by extrusion molding.

penalty for use anywhere in aircraft. Diecastings were not heat treatable to gain the high physicals often desired. They have metallurgical characteristics which are often not desirable and the alloys to be used are limited to those that diecast easily. They do have, however, great economy for the designers, where they can be used, in the saving of machine shop manhours. Because of this advantage diecastings have been of great importance to all industries including aircraft.

From this analysis it was felt there was great need for a process in all industry that could fabricate the type of alloy or combination of elements that could be held in a solution in a melting pot. Such a method would provide engineers with the most suitable metals or materials, efficiently fabricated to eliminate machine shop time and with all of the advantages in physical and mechanical properties, derived either from heat treat and/or hot working.

The conclusion from the analysis indicates there were three approaches to the problem.

First, to develop new and more accurate forging techniques which required the development of the progressive forge press,[3] a device that can progressively forge metal while at a temperature just below its solidus temperature. The experimental press was equipped with trimming platen to trim flash while held in the original die and while hot to avoid distortion and the setting up of internal stresses.

The second approach to the problem was the improvement of the diecasting technique and diecasting machines. This approach led to the development of the pressure mold casting process, which is actually a high quality diecasting method that produces heat treatable castings which are sound even with X ray inspection. But even this method was not the answer to the problem in accordance with the ultimate goal. Pressure mold casting[4] did not give sufficient hot working; neither was the pressure mold casting method adaptable to all types of alloys.

In the third process, which combined hot working through extrusion and then molding, was found the answer which seemed to meet all of the requirements of the research project. Alloys that could not be pressure mold cast could be hot worked through extrusion and molded with excellent accuracy, metallurgical and X ray results as well as very uniform hot work mechanical and physical properties. All of the advantages of subsequent heat treat were effective, including new types of heat treating. The properties of the molded extrusions without heat treatment are much superior to the same alloy cast by any of the known casting processes.

When production was first started by the extrusion molding process a number of years ago several specially constructed diecasting machines were adapted for the purpose. They were limited to 125,000 lb of total pressure and were satisfactory for very small parts and for certain

alloys only. The mold design incorporated a subsize test[5] bar fabricated integral with the part as shown in fig. 7. The customer could proof-test coupon samples of as many parts as desired, and by occasionally comparing a coupon specimen machined from the part with the properties of the attached test bar coupon, a good control was maintained. The part (fig. 4) was a cowling bracket and had been designed to be a forging but lack of forging facilities to meet the requirements plus the costly machine operations created a production problem. Approximately 400,000 of the brackets were produced for airplane companies. The first 100,000 were given 100 pct X ray inspection (see fig. 8) consisting of four different views. Of the 60,000 parts on which Army and Navy records are now available only 14 were considered not acceptable. This record certainly established an enviable production performance, inasmuch as previous to X ray inspection the forged parts had been given only a visual inspection and with very few rejections.

The most important feature of the extrusion molding process is the ease by which all types of alloys can be processed. Except for the variations known to be peculiar to various alloys, generally based on certain changes which may take place somewhere within the range of the liquidus-solidus temperature or may take place well below the solidus temperature, one alloy processes like another. Occasionally on parts containing large heavy masses combined with thin complicated shapes, there are indications of a hot short problem in one alloy that may not be apparent in some other alloy, but in all cases adjustments can be made in the technique to overcome the hot short situation. A 3 pct beryllium-magnesium-aluminum alloy that is not satisfactory for casting, much less forging, can be processed by the extrusion molding process into a gas turbine blade (see fig. 9) with a trailing edge 0.007 in. thick. The part is as brittle as glass with a Brinell of 128 when removed from the machine and requires a special heat treatment to improve its toughness. Fig. 10 shows a group of molded extrusion parts from a bomb rack mechanism. The balance of the parts in the rack assembly were extrusion molded or pressure mold cast from aluminum alloy and MM-32 beryllium copper.[6]

[3] *U. S. patent* 2,345,353; *other patents pending.*

[4] *U. S. patent* 2,391,182.

[5] *U. S. patent* 2,391,182.

[6] *U. S. patent* 2,400,566; *other patents pending; trade mark registered.*

In the second and concluding part of this article, to be published next week, the author discusses high temperature alloys from the metallurgical and fabricating aspects and suggests the possibility of producing a one-piece shrouded turbine wheel by extrusion molding. The author also recommends a more extensive use of proportional limit values for design purposes. The article concludes with a detailed discussion of the construction and operation of the extrusion molding machine.—Ed.

X-Ray Gaging of Sheet and Strip Thickness

AN X-ray thickness gage applicable to high speed mills which permits continuous measurement, roll pressure control and classification of metal sheet and strip has been announced by Westinghouse Electric Corp., Baltimore. It is equally adaptable to nonmetallic materials. This gage does not require contact with the material being gaged and hence will not mar the surface, it has a 1 pct sensitivity, provides access to areas not heretofore susceptible to being gaged and is unaffected by fluttering of the sheet or surface coatings such as lacquer, palm oil or water.

The gage employs two X-ray sources, as shown in the accompanying schematic diagram, whose radiations penetrate a standard and the test sheet in alternating cycles. The amount of radiation absorbed will vary with the thickness of the material. The X-ray energy not absorbed is picked up by the fluorescent screen unit in the photomultiplier which receives first the radiation penetrating the standard and then that penetrating the sheet. An amplifier and comparator transmits the difference in the photo-

(CONTINUED ON PAGE 227)

SCHEMATIC diagram of the X-ray thickness gage is shown in fig. 1. The application of the gage to a shearing line at J&L for the purpose of classifying material is shown in fig. 2. Arrow indicates position of gage.

Fig. 1

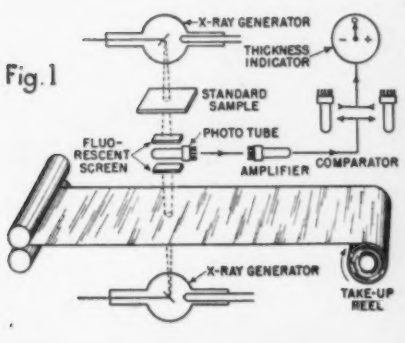
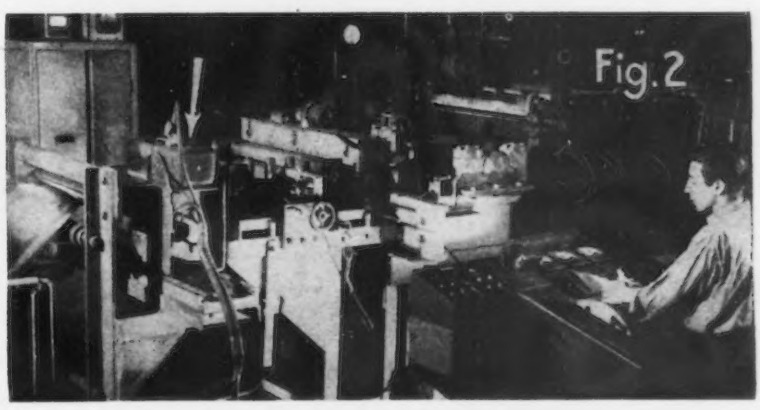


Fig. 2



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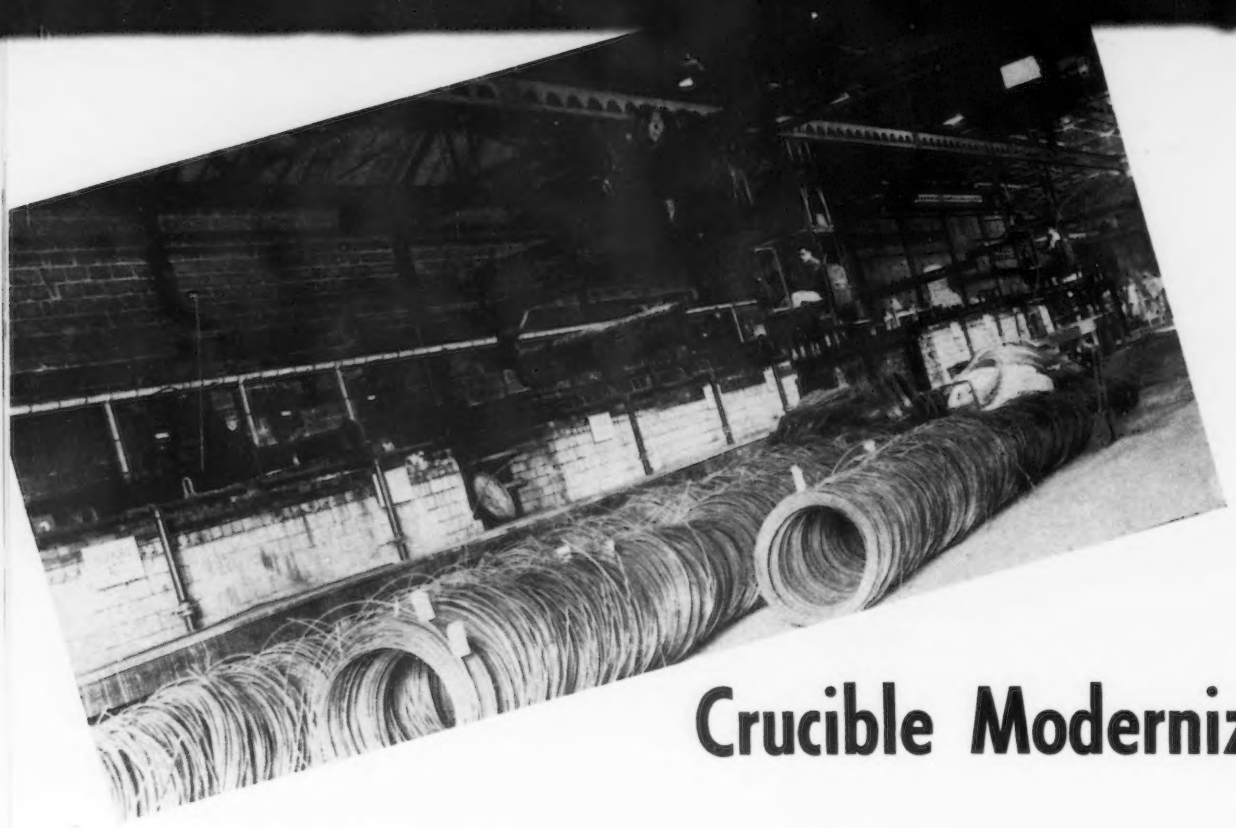

Crucible Modernizes

A production rate of 1000 tons of tool, stainless and specialty steel coil products monthly is expected to result from an expansion of plant capacity, more efficient rearrangement of rod and wire mill equipment and mechanization of material handling operations at the Sanderson-Halcomb works of Crucible Steel Co. of America. Details of this modernization program, discussed in this article, include a new straight line pickling unit, new annealing furnaces, continuous coil grinding equipment and a number of high speed draw benches.

AN expansion of plant capacity, a more efficient rearrangement of rod and wire mill equipment and complete mechanization of nearly all material handling operations is expected to permit production of 1000 tons of tool, stainless and specialty steel coil products per month at the Sanderson-Halcomb Works of the Crucible Steel Co. of America, Syracuse, N. Y. The $3.3 million rehabilitation program at the plant is based on a more efficient utilization of labor to permit reductions in the cost of production of cold finished tool, stainless and carbon steel wire.

This program is part of the $30 million plant improvement and expansion program which Crucible has under way. Under the overall program, all operations formerly located at the Sanderson Works in downtown Syracuse, have been transferred to the Halcomb Plant, where new melting facilities have been installed.

About 300 different types of wire, by analysis, are produced at the Sanderson-Halcomb Works, in diameters ranging from 0.013 in. to, and including, 5/8-in. round, with a sizable portion of the production consisting of squares, hexagons,

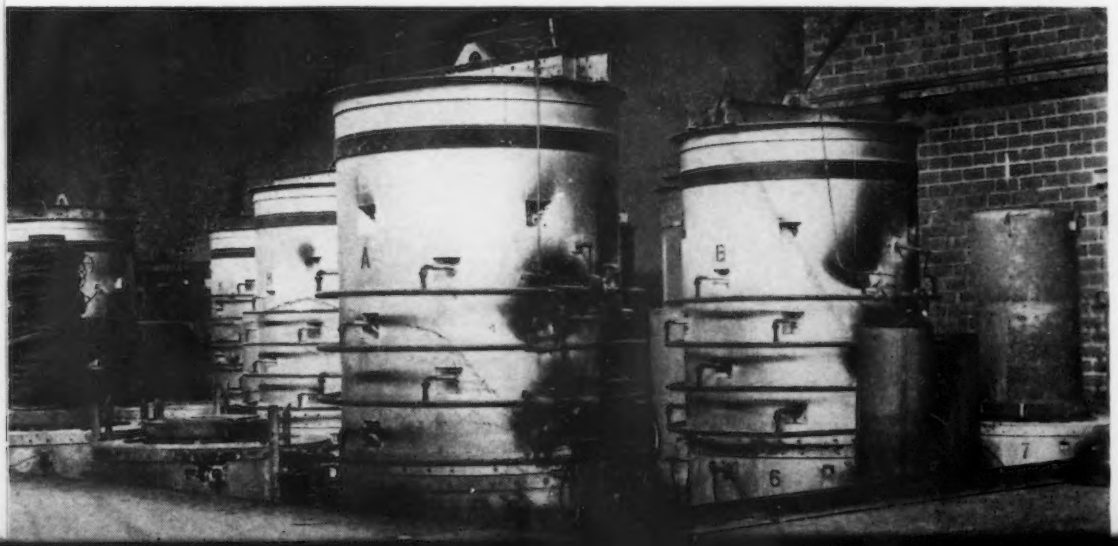

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FIG. 3 — Four recently installed circular hood type controlled atmosphere annealing furnaces.

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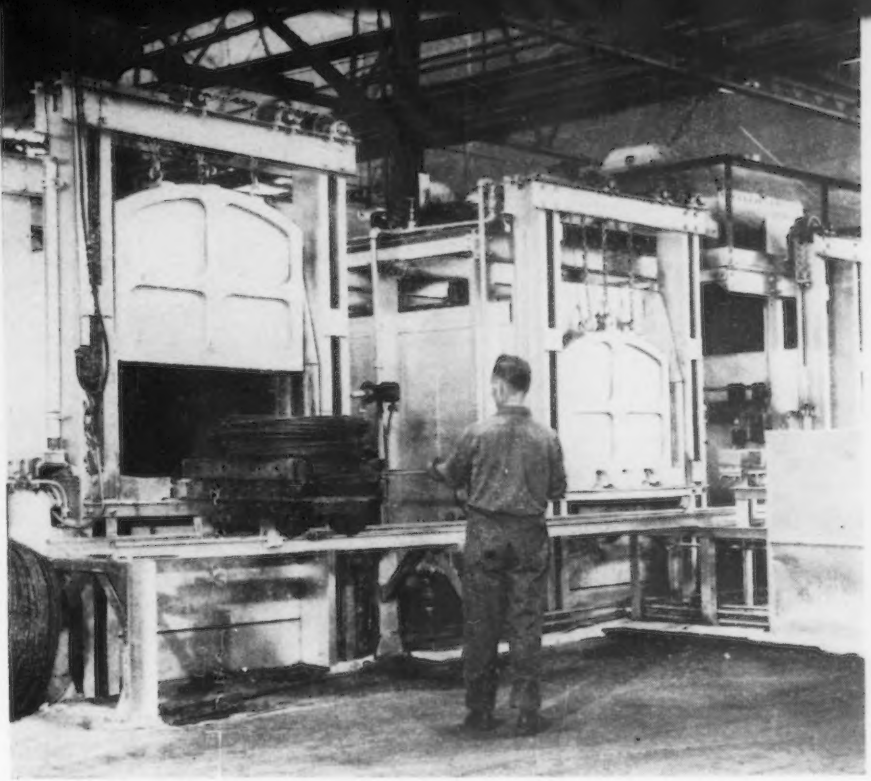
LEFT

FIG. 1—Recently installed straight line pickling facilities, containing 18 stations.

RIGHT

FIG. 2—Pusher type annealing furnaces installed in the wire department.



Wire Mill

by JOHN ANTHONY

Eastern Regional Editor,

THE IRON AGE

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octagons, triangles and various special shapes to customers' specifications. Rapid execution of these special shapes, as well as standard cross sections, is made possible by a self-contained die shop in the wire mill, completely equipped to produce any required die within established mill size limits.

Installation of a new straight line pickling unit was recently completed, with tanks constructed of a mastic-lined concrete shell, with acid proof carbon bricks set in Basolite mortar, erected by Nukem Products Co. of Buffalo. Crane handled hairpin hooks are used in the line and are designed to carry a 110-in. spread of wire or rod coils. Noxious fumes are completely controlled by an automatic system of blowers and vacuum exhausts.

Installation of this new pickling line has resulted in improved quality of product, and greater efficiency. Improved control of pickling time and temperature has resulted in elimination of losses caused by erratic pickling practices. Surface condition of pickled coils has also been improved.

The pickling installation, shown in fig. 1. contains 18 hairpin hook stations, serviced by two cranes. The line starts with two tanks, each containing approximately 25 tons of molten sodium hydroxide, maintained at an elevated temperature in which stainless steel is descaled. These tanks can be emptied with special pump made to Crucible's specifications, by the Morris Machine

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FIG. 4—Tandem centerless grinding unit showing carriage on which bars are fed automatically from first machine to second.

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FIG. 5 — High speed wire finishing blocks showing automatic braking device.

Works, Baldwinsville, N. Y., for the purpose of handling molten caustic. Also in the line are sulfuric acid tanks; a permanganate bath made up of sodium hydroxide and potassium permanganate in water; white pickle baths containing nitric and hydrofluoric acids, and lime coating tanks. The line is interrupted by a loading station, then continues with baths for the milder steels. All tanks are of 3200 gal capacity and can be siphoned when necessary.

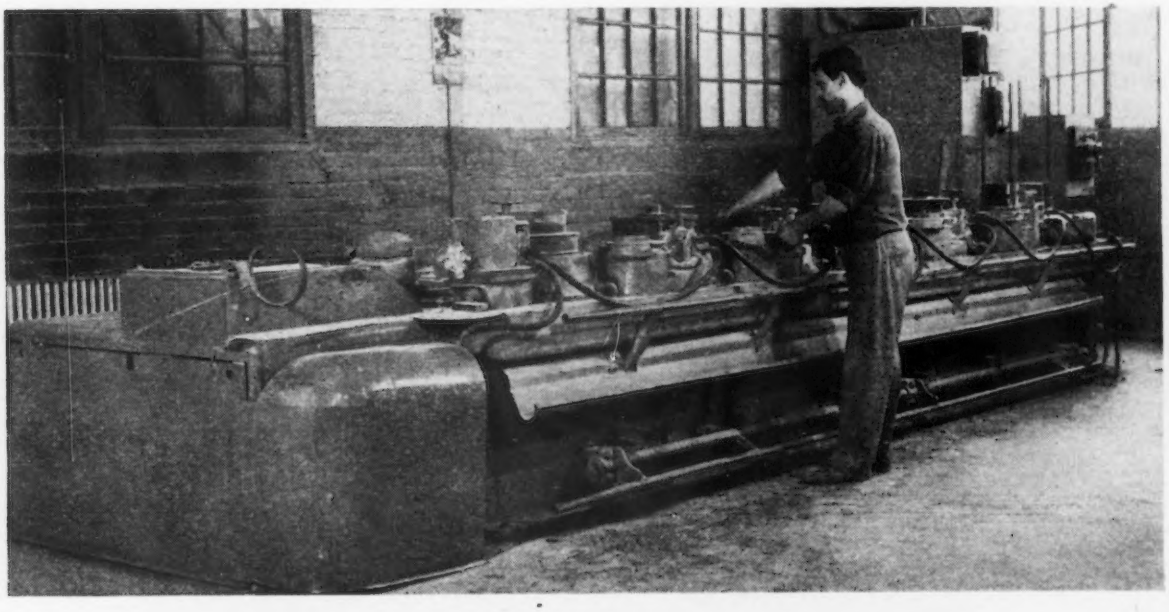
Nearly one half of the wire department cost of the Sanderson-Halcomb rehabilitation program was devoted to the new pickling and annealing installations. The old coke and gas-fired, hand loaded annealing furnaces have been replaced by automatic pusher type loading furnaces as shown in fig. 2, equipped with automatic temperature controls.

Four circular and one rectangular hood type atmosphere controlled furnaces have been added making a total of ten circular (as shown in fig. 3) and five, four-spindle rectangular furnaces available for protective atmosphere annealing.

In order to eliminate the possibility of creating surface imperfections and prevent surface scaling in the annealing of austenitic type stainless steel wire, two Upton salt bath furnaces, operating in a temperature range of from 1800° to 2100° F, have also been installed. In cases where these stainless steels are to be subjected to severe cold reductions, the coils are coated with lead lubricant by immersion in a lead coating tank, operated at 700° F.

Rod mill improvements included a greater spacing between stands, in order to permit the rolling of heavier coils. An important step in quality control of wire products takes place at the rod mill test shop. This control is continued in the wire mill where the quality of individual coil products is closely checked throughout operations. A metallurgical staff especially trained to handle wire mill problems functions in a self-

FIG. 6—One of the two 6-hole multiple Vaughn machines for drawing small diameter wire.



contained metallurgical laboratory maintained in the wire mill for that exclusive purpose. A new magnetic analysis unit of special design has been installed to insure the shipment of satisfactory material.

Continuous coil grinding equipment, developed by Crucible engineers, having automatic variable speed controls is available to produce wire products requiring special surface finishes, whose surface must be flawless. Another recent Crucible development, tandem centerless grinding (see fig. 4) employs conventional centerless grinding machines, arranged in pairs, in such a manner that bars are fed into the first machine by means of an automatic hopper feeding device then, by gravity, into the second machine and, finally, automatically removed. Each tandem unit is operated by a single operator. A new central cooling system services both the continuous coil grinders and the centerless grinders with sludge being automatically removed and the cleaned coolant recirculated to the machines.

High speed draw benches, shown in fig. 5, have also been designed by Crucible engineers to facilitate the finish drawing of fine wire at speeds from 300 to 1200 fpm. Drums on these machines are easily changed for variation of coil diameters. To insure safety in operation, automatic braking devices have been installed to stop the drums instantly if the wire being drawn becomes snarled. Two 3-hole multiple pass drawing machines have been relocated and two new 6-hole multiple drawing machines, shown in fig. 6, have been purchased from Vaughn Machinery Co., Cuyahoga Falls, Ohio. The fine wire drawing equipment is all located in a separate room where the temperature is constantly controlled to prevent moisture accumulation on in-process wire.

All individual equipment changes are being augmented by installation of a Cleveland overhead tramrail system in all bays of the wire mill, reducing manual handling to an absolute minimum. A railroad spur into the wire mill is depressed below floor level, permitting easy loading by ram or fork type 3-ton tractors which also perform stock moving in the wire mill. As a further innovation, to permit the loading of trucks at this same location, a heavy drawbridge has been installed over the railroad carloading well and is lowered to platform height of the trucks for loading by tractors.

Along with this concentrated improvement of mechanical facilities, a streamlined system for scheduling and promising of orders has been incorporated.

. . . NEW BOOKS . . .

"1947-48 Detroit Directory of Business and Industry." New edition of this directory carries industrial information for businessmen. There are sections devoted to officers of various trade societies, manufacturers agents and an automotive industry breakdown. Chas. J. Harris, 832 Fox Bldg., Detroit. $10.00. 450 p.

* * *

"Work Routing, Scheduling and Dispatching in Production," by John Younger and Joseph Geschelin. Book is offered as an aid to production men in planning job operations and time tables with the objective of reduction in cost of the work and cost of production control. Sections are devoted to cost accounting, planning from the sales curve, materials handling, plant layout and other aspects of production. Ronald Press Co., 15 E. 26th St., New York 10. $3.50. 168 p.

* * *

"1947 Guidebook-Directory for the Metal Finishing Industries." 16th edition of this reference manual contains sections on electroplating, abrasive methods, cleaning and pickling, surface treatments, and other finishing operations. An equipment and supply directory and a trade names supplement are included. Finishing Publications, Inc., 11 W. 42nd St., New York 18. $1.50. 436 p.

* * *

"How to Prepare and Maintain a Supervisors' Policy Manual." This study, based on a survey of company practices, is intended primarily as a handbook for those charged with the preparation of supervisors' policy manuals. It deals with techniques of collecting and appraising source material, writing the policies and procedures, coding and indexing them, and revising the manual as new material and changes develop. American Management Assn., 330 W. 42nd St., New York 18. $3.00. 71 p.

* * *

"Printed Circuit Techniques," (National Bureau of Standards Circular 468) by Cledo Brunetti and R. W. Curtis. This booklet describes the methods of applying wiring and circuit components directly to an insulated surface, thus combining ruggedness and miniaturization. Performance and application details as well as precautions and limitations are discussed. U.S. Government Printing Office, Washington 25. 25¢. 43 p.

* * *

"Industrial Applications of Infrared," by James D. Hall. Book contains essentially nontechnical information designed to acquaint the industrial heat user with the characteristics and performance of infrared lamps and equipment. The application possibilities of radiant energy in heat transfer, baking and drying and other uses are covered. McGraw-Hill Book Co., 330 W. 42nd St., New York 18. $3.50. 201 p.

* * *

"Magnesium Alloy Handbook." British publication, by Magnesium Elektron, Ltd., gives specifications and properties, methods of fabrication, applications and other information on magnesium alloys. A section deals with the comparatively new zirconium containing, high proof stress ratio, alloys. F. A. Hughes, Abbey House, Baker St., London, N.W.1, England. 25 shillings (ca. $5.00). 224 p.

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Lot Sampling

By G. M. BOWEN
General Inspector,
Feeder Div., Westinghouse
Electric Corp., East Pittsburgh, Pa.

Inspector setting visual comparator for screw machine operator.

THE single sample plan established in a screw machine department at Westinghouse and described herein, was developed primarily as an aid in correcting customer complaints, inspection costs and process variables. The former setup of detail inspection on each piece did not eliminate the defectives and did not contribute to any corrective action of the process.

In order to use this sampling plan, an acceptable quality limit was decided upon which would satisfy the customer division of the company. This was arrived at through conferences between the screw machine inspection departments and the inspectors of the customer division, the part involved being small breaker assembly sections. A quality level of 2 pct defectives was agreed upon. This means that regardless of the quality of the material presented for inspection, the quality of the material shipped will average less than 2 pct defectives, assuming that all lots which fail to meet the sampling plan are inspected and all the defectives are removed.

The plan setup provides for a sample to be taken on every lot, regardless of the size of the lot. For any given lot size, there is a corresponding sample size to be taken and the permissible number of defective pieces allowed in the sample as indicated in the table given in fig. 1. If the number of defective pieces found in the sample is less than, or equal to, the allowed number, the entire lot is passed. If the number of defectives is greater than the allowed number, the entire lot is rejected and detailed. The results of the sampling or routine inspection are posted on the record card.

A review of the cards after the sampling plan had been in effect for sometime indicated that the majority of the defectives were being produced on the same jobs. With the aid of frequency distribution and control charts, it was found difficult to maintain the specified tolerance with the existing machining and checking equipment. New tools and checking fixtures were secured and this helped materially, but it did not eliminate a sufficient amount of the process variables.

The results of this statistical review were shown the design engineer, and with the guarantee that the specified tolerances would be absolutely maintained, he again reviewed the sub-assembly drawings and rationalized the tolerances on all screw machine parts which brought about the desired results and made it both possible and practical for these items to be sampled for process acceptance.

To verify the sampling procedure, several other customers were asked to recheck the sampling acceptance, and report to the screw machine parts inspection department on troubles experienced on the subassemblies which indicated that the average outgoing quality level was 0.7 pct defective.

To establish the machine operator as a part of this method of controlling quality and to prevent the shifting of the quality responsibilities from the operator to the inspector, it was necessary to promote a program to make the operator more quality conscious.

The time study formula included in the process provided that the operator be paid for checking the first and last piece produced from each bar stock. With this arrangement it was possible to obtain full operator responsibility for the duplication of parts. This plan permitted the elimination of the roving inspection procedure whereby a sample piece from every machine in

# of Screw Machine Parts . . .

A single sample plan for screw machine parts which reduced overall defective volume by 28 pct is explained in this article. The plan, designed to hold defectives to 2 pct, includes provisions for encouraging quality consciousness on the part of the machine operator. In addition to a substantial cut in defectives, the setup permitted a cut of more than 60 pct in inspection personnel.

the department had to be checked at least once each hour of the day at the machine.

Any process will develop defectives on occasion and it becomes necessary to classify these defectives for corrective action. An operational sorting, or 100 pct inspection, is required whenever a manufacturing process results in variables too great to accept on a sampling basis. The corrective sorting also may be the result of the failure on the part of the operator to produce parts to meet the standard of acceptance. Both sortings can be eliminated by proper control.

Sorting can be replaced by sampling when there are reasonably frequent occurrences of lots which contain a per cent defective less than the allowable per cent defective. The acceptance sampling is merely a grading of the lots, accepting those which need not be detail inspected and rejecting the lots which require further detailing. The prevention of detailing is desirable. However, the real answer is to take the neces-

SAMPLING PLAN

LOT SIZE	SAMPLE SIZE	NO. DEFECTIVES ALLOWED IN SAMPLE
UNDER 100	50	0
100- 300	80	1
301- 500	115	2
501- 1000	150	3
1001- 2000	155	3
2001- 3000	180	4
3001- 4000	188	4
4001- 5000	195	4
5001- 7000	240	5
7001-10000	250	5
10001-20000	320	6
20001-50000	335	6
50001-100000	400	7

FIG. 1—Table indicates to inspector size of sample required for establishing a scientific sampling of a lot of parts, based on a given allowable percentage of defects.

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BELOW

FIG. 2—Form used to list causes and other details of parts found defective.

NAME OF PART OR PARTS	Lot S.O. Size	L-SPEC. DWG.-STYLE OR PATT. NO.	ITEM NO.	NO. OF UNITS INSPECTED	NO. OF UNITS DEFECTIVE	NAME OR CHECK NO. OF OPERATOR RESPONSIBLE	NATURE OF DEFECT	SCRAP OR REPAIR	CHARGE TO	SALVAGE OR DEF. APP. TAG NO.
Stud	1000	856654	30	150	6	A-49 -10	2-1/4" Thread length varies to 2"	R	Operator	749835
Shaft	475	1-A-4206	8	115	4	A-49 -21	.171 Dimension measures .162	R	Operator	749840
Pin	1500	3-B-6871	12	155	9	A-49 -108	1.145 Dimension measures 1.143	S	Operator	749885

DETAIL DEFECTIVE REPORT
WESTINGHOUSE FORM 7858 G

SECTION

FOREMAN

INSPECTOR J. H. Pepple

DATE 1-2-48

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sary corrective action to eliminate the defectives.

When a lot is found to be beyond the acceptable limit of 2 pct defectives, the parts are reviewed by the foreman who determines the responsibility for the necessary repairs or detail sorting. If the parts are to be checked in detail, the inspector issues a defective apparatus tag and distributes the various copies in the regular manner to the accounting, inspection and production departments. One copy is retained by the inspector for a specific reminder to inspect again after the defect has been repaired. A weekly summary sheet (fig. 2) advises the foreman of the progress on repairs. On completion, the parts are again lot sampled for acceptance. This procedure assures a proper classification of defective material for inventory adjustments.

To date this quality control procedure has resulted in a reduction of the account covering factory expense in defective workmanship by approximately 28 pct. At present the control department is operating with 10 male inspectors, against a former staff of 15 male inspectors and 23 girl detailers at approximately the same rate of production.

It has been our experience that this sampling method of inspection is a valuable inspection tool. It is economical and efficient, and will control the outgoing quality at any predetermined level. The information accumulated presents a definite picture of where corrective action is required. The plan itself does not improve quality, but depends upon the supervisors to intelligently use the information made available to them.

Induction Hardening Cast Iron

USE of induction hardening of cast irons, as applied to hardening of the bore surface of cylinder liners in large internal combustion engines, in order to improve the wear resistance of the part was discussed in a paper by J. R. Sloan, staff metallurgist, and R. H. Hays, metallurgical engineer, Caterpillar Tractor Co., at any ASM session at the recent Metal Congress. The paper was entitled "Some Factors Affecting the Induction Hardening of an Alloy Cast Iron."

The investigation reported by the authors consisted of the induction hardening of the bore surfaces of a series of mildly alloyed cast iron cylinder liners, comparing the effects of two frequencies, 3000 and 9600 cycles per sec, and varying the power settings for the latter frequency. The principal results of increasing the frequency and power input were an increase in surface temperatures and depth of case.

Higher frequencies were found to concentrate the heating energy more closely to the surface, thereby raising the surface temperatures and producing steeper temperature gradients which, in turn, give slightly narrower and more uniform transition boundaries.

Higher temperatures resulted in the formation of a more highly alloyed austenite by reabsorption of elements concentrated along the primary solidification cell boundaries and some resolution of carbon from graphite flakes. This austenite, being more highly alloyed with carbon and other elements, resists transformation to martensite until near room temperatures, resulting in greater proportions of retained austenite and somewhat softer surfaces. This austenite can be transformed in part by subzero cooling with a resultant increase in hardness. Tempering to as little as 330°F will so stabilize the austenite that the expected effects of the cooling treatment will be nullified. Tempering to temperatures of 500°F for 3 to 4 hr will also largely transform this austenite to ferrite-carbide aggregates of the bainitic type.

A greater variance of results was said to be expected from an overheated induction-treated cast iron than a similarly treated mild carbon steel, since the most deleterious effect to the steel would be a coarsening of the structure, while a cast iron would have, in addition to this coarsening, some resolution of graphite and other constituents which change the hardenability and M_s temperatures of the matrix. This effect is chiefly present along cell boundaries where segregations are greatest. Also, the increased temperatures may actually melt certain low melting constituents present in cast iron.

A light etching constituent developed by nital and picrol etchants was thought to be a mixture of steadite and carbides, as some of the structures produced by induction hardening could be duplicated in the mottled regions of high phosphorous irons. Many of these structures were found to have actually melted during the induction heating cycle, being exclusively located near the surfaces of the 9600-cycle per sec liners. This melting was indicated by the formation of a network structure of the steadite-carbide constituents that in most instances could be traced to one of these areas, which was acting as the supplying reservoir. A small microshrink was generally associated with this area, signifying a contraction upon solidification, an effect not at all unusual. Similar structures were not observed in the unhardened zone.

Normally, whenever economically feasible, the decision as to suitability of one method in preference to another is dictated by actual performance. Therefore, the authors held it to be of considerable interest to discover that while metallurgical factors indicated a poorer structure for the 9600-cycle per sec liners, actual wear tests showed little difference between the two frequencies. Thousands of engines equipped with liners of each type were said to have operated successfully for several years in actual service. This similarity in performance was thought to be due, in part, to the specialized application chiefly involving abrasion and corrosion resistance and to the heavy layer of unhardened backing metal.

The Iron Age Metalworking Buyers' Guide

. . . A fifth section of the Buyers' Guide is presented herewith. The first section of this directory appeared in the Annual Review Issue, Jan. 1, 1948, p. 208. This guide has been developed to give executives and purchasing agents of the metalworking industry a directory with a much finer breakdown in classifications than has been heretofore available. Additional sections of the guide will be published weekly.

— C —

Cabinets, Refrigeration

Bowser, Inc., Fort Wayne 2, Ind.

BRADLEY, C. C., & SON, INC., Syracuse 1, N. Y.

Cable, Flexible

Anaconda Wire & Cable Co., 25 Broadway, New York.

Charles Fischer Spring Co., 751 Atlantic Ave., Brooklyn 17, N. Y.

ELECTRIC AUTO-LITE CO., Wire & Cable Div., Port Huron, Mich.

Essex Wire Corp., Wall St., Fort Wayne, Ind.

GENERAL ELECTRIC CO., Appliance & Mdse. Dept., Bridgeport, Conn.

Cadmium Cyanide

Allied Industrial Products Co., 620 N. Michigan Ave., Chicago 11.

DU PONT DE NEMOURS, E. I., & CO., INC., Electroplating Div., Wilmington, Del.

Harshaw Chemical Co., Cleveland.

Cadmium Oxide

Allied Industrial Products Co., 620 N. Michigan Ave., Chicago 11.

Beam-Knodel Co., 195 Lafayette St., New York 12.

DU PONT DE NEMOURS, E. I., & CO., INC., Wilmington 98, Del.

HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Sommers Bros. Mfg. Co., 3439 No. Broadway, St. Louis 7.

Cadmium Plating Process

Allied Industrial Products Co., 620 N. Michigan Ave., Chicago 11.

Beam-Knodel Co., 195 Lafayette St., New York 12.

DU PONT DE NEMOURS, E. I., & CO., INC., Wilmington 98, Del.

HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Milwaukee Stamping Co., 809 72nd St., Milwaukee 14.

Nankervis, Geo. L., Co., 5442 Second Blvd., Detroit 2.

Sommers Bros. Mfg. Co., 3439 N. Broadway, St. Louis 7.

U. S. Galvanizing & Plating Equipment Corp., 27 Hayward St., Brooklyn 11.

Cages Pickling (see Pickling Cages)

Calciners

ALLIS-CHALMERS MFG. CO., Milwaukee.

AMERICAN GAS FURNACE CO., Elizabeth, N. J.

Bartlett & Snow, C. O., Co., Harvard Ave., Cleveland.

BLAW-KNOX DIV., BLAW-KNOX CO., Farmer's Bank Bldg., Pittsburgh.

Calcium Boride

ELECTRO METALLURGICAL CO., 30 E. 42nd St., New York 17.

Calcium Carbide

AIR REDUCTION SALES CO., 60 East 42nd St., New York 17.

Baker Chemical, J. T., Co., North Phillipsburg, N. J.

LINDE AIR PRODUCTS CO., 30 E. 42nd St., New York 17.

MODERN ENGINEERING CO., 3409 Pine Blvd., St. Louis 3.

Monsanto Chemical Co., St. Louis.

NATIONAL CYLINDER GAS CO., Wacker Dr., Chicago.

Calcium-Manganese-Silicon

ELECTRO METALLURGICAL CO., 30 E. 42nd St., New York 17.

Foundry Manganese Co., S. 15th St., Philadelphia.

Samuel, Frank, & Co., Inc., S. 15th St., Philadelphia.

Calcium Metal and Alloys

Belmont Smelting & Refining Works, Inc., Belmont Ave., Brooklyn 7.

ELECTRO METALLURGICAL CO., 30 E. 42nd St., New York 17.

Metal Hydrides, Inc., 16 Congress St., Beverly, Mass.

Niagara Falls Smelt. & Refg. Div., Continental-United Indus. Co. Inc., 2208 Elmwood Ave., Buffalo 17.

Samuel, Frank, & Co., Inc., Harrison Bldg., Philadelphia.

Calcium Molybdate

CLIMAX MOLYBDENUM CO., 500 5th Ave., New York.

LOBDELL CO., P. O. Box 1108, Wilmington 99, Del.

MOLYBDENUM CORP. OF AMERICA, Grant Bldg., Pittsburgh.

Camshafts

CANTON DROP FORGING & MFG. CO., Willett Ave., Canton, Ohio.

Federal Drop Forge Co., Lansing, Mich.

Gunite Foundries Corp., Rockford, Ill.

OHIO CRANKSHAFT CO., 3800 Harvard Ave., Cleveland 1.

Canvas

Bemis Bro. Bag Co., 408 Pine St., St. Louis 2.

Daniels, C. R., Inc., 4900 Block Wetheredsville Rd., Hillsdale, Baltimore 16.

Carbides, Cemented (See Tools, Cemented Carbide)

Carbide Tool Grinders

Beals, McCarthy & Rogers, Inc., (Distributors), 50 Terrace, Buffalo 5.

Blake, Edward, Co., 634 Commonwealth Ave., Newton Centre 59, Mass.

BOTWINIK BROS. OF MASS., INC., 5 Sherman St., Worcester 1.

CARBOLOY CO., INC., Box 237, Roosevelt Park P. O., Detroit 32.

Hager, E. F., & Son, Queens Village, L. I., N. Y.

Indianapolis Machy. & Sup. Co., (Distributors), 1959-69 S. Meridian St., Indianapolis 6.

Interstate Machinery Co., 1435 W. Pershing Rd., Chicago 9.

LE BLOND, R. K., MACHINE TOOL CO., Madison & Edwards Rds., Cincinnati 8.

Scherr, George, Co., Inc., 418 Broome St., New York 12.

SELLERS, WM., & CO. INC., 1665 Hamilton St., Philadelphia 30.

Carbon, Activated (See Activated Carbon)

Carbon Analyzing Instruments

GORDON, CLAUD S., CO., 3000 S. Wallace St., Chicago 16.

Leitz, E., Inc., 304 Hudson St., New York 13.

Carbon Electrodes (See Electrodes, Carbon)

Carbon Products

Great Lakes Carbon Corp., P. O. Box 637, Niagara Falls, N. Y.

INTERNATIONAL GRAPHITE & ELECTRODE CORP., St. Mary's, Pa.

Keystone Carbon Co., Inc., 1935 State St., St. Marys, Pa.

Morganite Brush Co., Inc., 3302-3320 48th Ave., Long Island City 1, N. Y.

NATIONAL CARBON CO., INC., 30 E. 42nd St., New York 17.

PARK CHEMICAL CO., 8088 Military Ave., Detroit 4.

Pittsburgh Carbon Brush Co., 801 Fulton St., Pittsburgh 12.

Stackpole Carbon Co., St. Marys, Pa.

Steel Sales Corp., 3352 S. Pulaski Rd., Chicago 23.

Universal Power Corp., 769 Carnegie Ave., Cleveland 15.

Carbon Refractories (See Refractories, Carbon)

Carburizer Screening Machinery

PARK CHEMICAL CO., 8088 Military Ave., Detroit 4.

Thurner Engineering Co., 809 W. National Ave., Milwaukee 4.

Carburizing (See Heat Treating)

Carburizing Boxes

Alloy Casting Co., Victor Ave., Champaign, Ill.

BELLEVUE INDUSTRIAL FURNACE CO., 2974 Bellevue Ave., Detroit 7.

BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh.

Chicago Steel Foundry Co., Kedzie Ave. & 37th St., Chicago 32.

Driver-Harris Co., P. O. Drawer No. 31, Harrison, N. J.

GAS MACHINERY CO., 16100 Waterloo Rd., Cleveland 10.

General Alloys Co., Boston 27.

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Carburizing Boxes—Continued

Gordon, Claud S., Co., 3000 So. Wallace St., Chicago 16.

HOSKINS MFG. CO., 4447 Lawton Ave., Detroit 8.

MICHIANA PRODUCTS CORP., Michigan City, Ind.

OHIO STEEL FOUNDRY CO., P. O. Box 900, Springfield, Ohio.

Slyver Steel Casting Co., Milwaukee.

Stanwood Corp., 4808 Cortland St., Chicago 39.

Sterling Alloys, Inc., Woburn, Mass.

Walz & Krenzer Inc., 250 Mount Hope Ave., Rochester 7, N. Y.

YOUNGSTOWN WELDING & ENGINEERING CO., 3800 W. Oakwood Ave., Youngstown 9, Ohio.

Carburizing Compounds

CARBIDE & CARBON CHEMICALS CORP., 30 E. 42nd St., New York 17.

Char Products Co., Merchants Bank Bldg., Indianapolis 4.

DU PONT DE NEMOURS, E. I., & CO., INC., Wilmington 98, Del.

GORDON, CLAUD S., CO., 3000 So. Wallace St., Chicago 16.

Mitchell-Bradford Chemical Co., 2446 Main St., Stratford Post Office, Bridgeport, Conn.

PARK CHEMICAL CO., 8088 Military Ave., Detroit 4.

Rodman Chemical Co., Verona, Pa.

Carburizing Furnaces
(See Furnaces, Carburizing)

Car Dumpers

Heyl & Patterson, Inc., Water St., Pittsburgh.

LINK-BELT CO., 300 W. Pershing Rd., Chicago 9.

McNally Pittsburgh Mfg. Corp., Pittsburg, Kansas.

ROBINS CONVEYORS INC., Passaic, N. J.

Car Movers, Railway

ADVANCE CAR-MOVER CO., 112 No. Outagamie St., Appleton, Wis.

Cars, Industrial

American Car & Foundry Co., 30 Church St., New York 8.

Athey Products Corp., 5634 W. 65th St., Chicago 38.

ATLAS CAR & MFG. CO., Cleveland 10.

Austin-Western Co., Aurora, Ill.

Differential Steel Car Co., Findlay, Ohio.

Western Pipe & Steel Co., Bush Ave., San Francisco.

Cars, Steel Mill

International Engineering, Inc., Dayton.

Pittsburgh Steel Foundry Corp., Glassport, Pa.

Pressed Steel Car Co., Inc., Pittsburgh 30.

Case Hardening
(See Heat Treating)

Case-Hardening Compounds

Char Products Co., Merchants Bank Bldg., Indianapolis 4.

DU PONT DE NEMOURS, E. I., & CO., INC., Wilmington 98, Del.

Mitchell-Bradford Chemical Co., 2446 Main St., Stratford Post Office, Bridgeport, Conn.

PARK CHEMICAL CO., 8088 Military Ave., Detroit 4.

Reilly Tar & Chemical Corp., Merchants Bank Bldg., Indianapolis 4.

Case-Hardening Furnaces
(See Furnaces)

Cast Cutting Alloys

ALLEGHENY LUDLUM STEEL CORP., Forging & Casting Div., Ferndale 20, Mich.

Indianapolis Machy. & Sup. Co., (Distributors), 1959-69 S. Meridian St., Indianapolis 6.

Wall-Colmonoy Corp., 714 Fisher Bldg., Detroit 2.

Casters, Industrial

Bassick Co., Div. of Stewart-Warner Co., Bridgeport 2, Conn.

Darnell Corp., Ltd., 3517 E. 11th St., Long Beach 4, Cal.

Hamilton Caster & Mfg. Co., 1637 Dixie Highway, Hamilton, Ohio.

Thomas Truck & Caster Co., Keokuk, Iowa.

Casting Alloys, Aluminum

Ajax Metal Co., Richmond St., Philadelphia.

ALUMINUM CO. OF AMERICA, Gulf Bldg., Pittsburgh.

Apex Smelting Co., W. Taylor St., Chicago.

Belmont Smelting & Refining Works, Belmont Ave., Brooklyn.

BOHN ALUMINUM & BRASS CORP., Lafayette Bldg., Detroit.

• Every company in the metalworking industry is urged to check this section of the new IRON AGE Metalworking Buyers' Guide, and send in corrections and additions to assure complete accuracy in the first reprint of the directory. Forward corrections to THE IRON AGE, Attention Buyers' Directory, 100 E. 42nd St. New York 17.

FEDERATED METALS DIV., AMER. SMELTING & REFINING CO., 120 Broadway, New York 5.

REYNOLDS METALS CO., INC., S. Third St., Louisville.

Casting Alloys, Brass and Bronze

Acme Aluminum Alloys, Inc., Dayton.

Advance Pressure Castings, Inc., N. 15th St., Brooklyn 22.

Ajax Metal Co., Richmond Ave., Philadelphia 23.

American Crucible Products Co., Oberlin Ave., Lorain, Ohio.

American Manganese Bronze Co., Rhawn St., Philadelphia 36.

American Metal Co., Ltd., 61 Broadway, New York.

AMPCO METAL, INC., Burnham St., Milwaukee 4.

Atlas Foundry Co., 520 Lyons Ave., Irvington, N. J.

Aurora Metal Co., Thurnauer Ave., Aurora, Ill.

Barth Smelting Corp., 95 Chapel St., Newark, N. J.

Belmont Smelting & Refining Works, Inc., 336 Belmont Ave., Brooklyn.

BETHLEHEM STEEL CO., Bethlehem, Pa.

Binney Castings Co., Toledo.

Birkenstein, Geo., & Co., S. Michigan Ave., Chicago.

BOHN ALUMINUM & BRASS CORP., Lafayette Bldg., Detroit.

Bunting Brass & Bronze Co., Spencer St., Toledo 9.

CRAMP BRASS & IRON FOUNDRIES, Eddystone, Pa.

Duquesne Smelting Corp., 33rd St., Pittsburgh.

FEDERATED METALS DIV., AMER. SMELTING & REF. CO., 120 Broadway, New York 5.

Frontier Bronze Corp., Elmwood Ave., Niagara Falls, N. Y.

Greenfield, Samuel, Co., Inc., Stone Ave., Buffalo.

Hills-McCanna Co., Nelson St., Chicago 18.

Kramer, H., & Co., Inc., S. Loomis St., Chicago.

Lewis-Mathes Co., Chouteau Ave., St. Louis.

Liberman & Gittlen Metal Co., Grand Rapids, Mich.

Lumen Bearing Co., Lathrop St., Buffalo 12.

Magnus Metal Corp., 111 Broadway, New York.

MALLORY, P. R., & CO., INC., Mallory Bldg., Indianapolis.

McGill Mfg. Co., Inc., Oak St., Valparaiso, Ind.

Michigan Smelting & Refining Div., Detroit.

Mt. Vernon Die Casting Corp., Pearl St., Mt. Vernon, N. Y.

Mueller Brass Co., Port Hurnon, Mich.

Nassau Smelting & Refining Co., Inc., Tottenville, N. Y.

NATIONAL BEARING DIV., AMERICAN BRAKE SHOE CO., Manchester Ave., St. Louis 10.

National Bronze & Aluminum Foundry Co., Cleveland.

New Products Corp., N. Shore Dr., Benton Harbor, Mich.

Niagara Falls Smelting & Refining Corp., Jarvis Ave., Buffalo.

North American Smelting Co., Tioga Ave., Philadelphia.

PHOSPHOR BRONZE SMELTING CO., Washington Ave., Philadelphia 46.

Richards Co., Inc., Malden, Mass.

River Smelting and Refining Co., Bradley Rd., Cleveland.

Roessing Bronze Co., Aetna, Pa.

SAGINAW BEARING CO., Saginaw, Mich.

SHENANGO PENN MOLD CO., Dover, Ohio.

Superior Bearing Bronze, Inc., Banker St. Brooklyn 22.

TITAN METAL MFG. CO., Bellefonte, Pa.

Universal Castings Corp., 5821 W. 66th St., Chicago.

Waukesha Foundry Co., Waukesha, Wis.

Wellman Bronze & Aluminum Co., 6000 Superior Ave., Cleveland.

Whipple & Choate Co., South Ave., Bridgeport, Conn.

White Bros. Smelting Corp., Philadelphia.

Wood, J. R., Products Corp., 70 Washington St., Brooklyn.

Casting Equipment, Precision

AUSTENAL LABORATORIES, INC., 5932 S. Wentworth Drive, Chicago 21.

BALDWIN LOCOMOTIVE WORKS, SOUTHWARK DIV., Simpson St., Eddystone, Pa.

CENTRIFUGAL CASTING MACHINE CO., P. O. Box 947, Tulsa, Okla.

FELLOWS GEAR SHAPER CO., Springfield, Vt.

HAYNES STELLITE CO., 30 E. 42nd St., New York 17.

Jelrus Co., 136 W 52nd St., New York 19.

Rockwell, W. S., Co., 200 Eliot St., Fairfield, Conn.

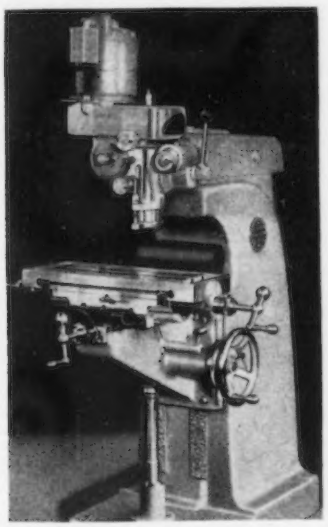
(CONTINUED ON PAGE 123)

New Equipment . . .

A vertical milling machine available with either swivel or universal head, an eight-station automatic for machining cylinder blocks, a metal powder press, butt and arc welders, a high-speed heat-treating furnace, Brinell testing machine and other instruments, and several smaller units such as an impact nut setter, and lubricated plug valves are described this week.

Swivel-Universal Head Mill

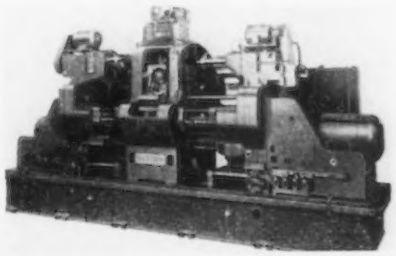
A RAM type, hand feed vertical milling machine, available with either swivel head or universal head, has replaced the former 8-D fixed head vertical milling machine, the manufacturer *George Gorton Machine Co.*, Racine, Wis., has announced. Adjustable ram, heavy column, sensitive table and saddle movements, and quickly adjustable swivelling or universal head with super-speed spindle make the machine suitable for the toolroom, die-mold shop and for production milling on small parts.



Other features include positive spindle brake, spindle lock for holding spindle at desired position for setting-up and milling operations, and screw-type spindle depth stop graduated in thousandths providing positive and accurate setting of cutter depth. A ½ hp, high torque, reversible motor provides 6 spindle speeds from 300 to 5000 rpm. Speeds from 600 to 10,000 rpm are available.

Eight-Station Automatic

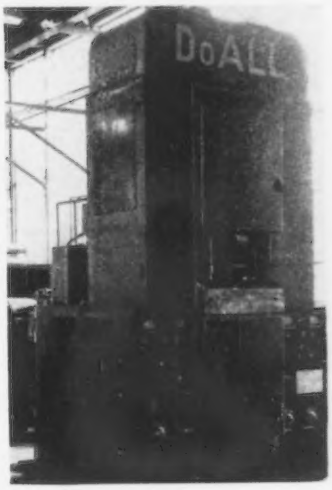
AMONG special-purpose, automatic machines developed by *Snyder Tool & Engineering Co.*, 3400 E. Lafayette, Detroit, is a two-way hydraulic feed machine which drills, reams, countersinks, spotfaces, bores and taps holes in both ends of hydraulic lift cylinder blocks. The machine has eight work-stations with eight trunion-mounted work-holding fixtures in



which the workpiece is clamped manually. An electrically operated automatic Geneva index routes the work through successive operations. Mounted opposed are two master drive heads from which power is transmitted to individual auxiliary heads at each station. The machine is fully automatic. Tooling can be high-speed steel or carbide; drill speeds are 80 fpm and reamers 45 fpm. Feeds are variable and are adjusted by hydraulic meter valve. Production is 40 pieces an hour at 80 pct efficiency, it is claimed. The right side of the machine has a 37-spindle multiple head and a 2-spindle tapping head. The left side has a 23-spindle multiple head and a 6-spindle tapping head. The base construction is normalized welded steel.

Metal Powder Press

IN a 30-60 ton metal powder press manufactured by *Continental Machines, Inc.*, and marketed by *DoAll Co.*, Des Plaines, Ill., pressures are applied from the top and bottom as well as side simultaneously through hydraulic cylinders. Each top and bottom center cylinder and each pair of top and bottom outside cylinders and the two side cylinders are operated by separately driven Vickers, 14 gal, 2000 psi pumps driven by individual 20-hp motor at 1200 rpm. This cylinder setup and ram action is said to make the press adaptable to a variety of shapes, either cored or solid. Each set of cylinders can be individually adjusted for rate of travel on both power stroke and return stroke. They can also be regulated for pressure. Rate of travel on the power stroke is adjustable from 0 to 100 ipm and the



return stroke from 2 to 200 ipm. Regulation for both speed and pressure is handled from the control panel. Positive mechanical stops provide dimensional control. Feed mechanism is air injection type. Production rates are dependent on the size part produced.

Special Purpose Butt Welder

ANNOUNCEMENT of a special purpose automatic butt welder for the welding of nickel ground wire to spark plug shells, has been made by *Agnew Electric Co.*, Milford, Mich. It has fully synchronous control of welding current and time. Spark plug shells are placed

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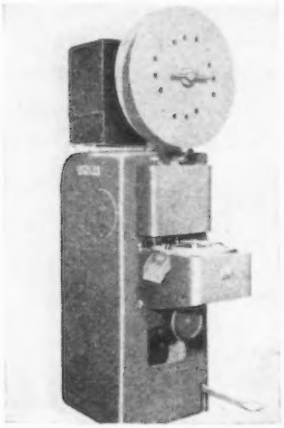
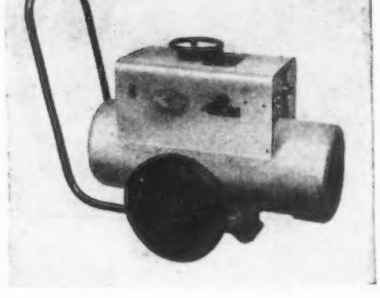
in the indexing table; wire from the reel is fed to length, clamped, cut off, welded to shell and the ejection of the finished part is entirely automatic. Driven by a motorized reducer unit through an adjustable friction clutch, the machine oper-



ates as long as the foot pedal is depressed. Hand operation is provided for setting up purposes and a 16-position table, for loading shells in five positions. This type of automatic butt welder can be readily adapted to high speed welding of small parts, it is stated.

Arc Welding Machine

AVAILABILITY of the new Hornet 36A motor generated arc welding machine has been announced by *Wilson Welder & Metals Co., Inc.*, 60 E. 42nd St., New York 17. The machine is available in 200, 300 and 400-amp models, is smaller in size and is said to weigh



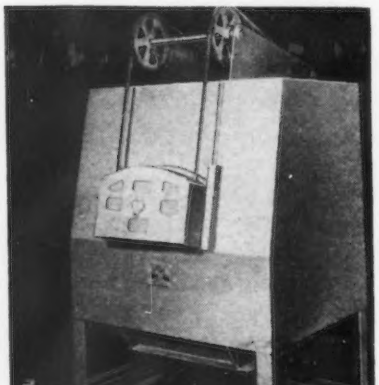
one-third less than previous Hornet models. The welder is designed for either 220 or 440 v with no change in relays or additional wires being required for voltage reconnection. It features weather resistant enclosed drip proof construction and moisture proof insulation.

Motors

A LINE of totally enclosed, fan-cooled, wound-rotor motors, announced by *Allis-Chalmers Mfg. Co.*, Milwaukee, are built with an improved tube type air-to-air heat exchanger, greater efficiency of which is said to permit a reduction in size compared to older models. For special applications where atmospheric conditions are unfavorable, the motors may be obtained with stainless steel ventilating tubes, fans and end plates and cast iron terminal boxes and collector ring enclosures. The company states the motors are suitable for all fields of industry.

High-Speed Furnace

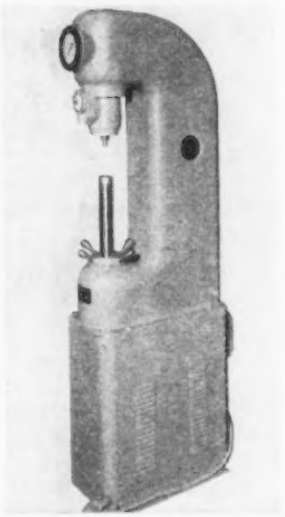
CLOSE temperature control through vertically mounted non-metallic elements, and even heat distribution in a range of 1100° to 2500°F make the new



high-speed furnace announced by *Sunbeam Stewart Furnace Div.*, 4399 Ogden Ave., Chicago 23, suitable for toolroom application. Low heat storage insulating refractory lining allows the furnace to be brought up to temperature rapidly. A patented seal-tite door assuring a tight seal between door and furnace at all times, is operated by a foot-operated air-hoist for convenience of loading. The furnace is available in sizes: 6x12x18 in.; 9x15x24 in.; and 12x18x24 in. heating chambers.

Brinell Testing Machine

A BRINELL testing machine capable of checking up to 800 pieces per hr and of parts varying in diameter and thickness as much as ¾ in. without moving the elevating screw, has been announced by *Steel City Testing Machines, Inc.*, 8843 Livernois, Detroit 4. Identified as model KDR, the machine is motor driven, hydraulically operated and so constructed that it is



impossible to remove the specimen being tested before the full load has been applied to the penetrator. The machine is equipped with a comparator indicator which eliminates the necessity of using the Brinell microscope on production testing. Throat opening is 6 in. and maximum vertical opening is 14 in. The machine can be furnished with a foot or knee type starter switch.

Bench Grinder

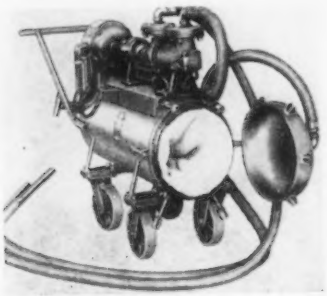
ADDITION of a bench grinder, type 4BAS4, has been made to the Cadet line of grinders produced by *Standard Electrical Tool Co.*, 2505 River Rd., Cin-

cinnati 4. The grinder is equipped with a 1/3 hp, 3600 rpm totally enclosed motor for 110 v, single phase, 50 or 60 cycle. Safety type enclosed guards each have exhaust outlet, adjustable spark breaker, and work rest. A double pole toggle switch is located in the base. The machine is furnished with two 6 x ¾ x ½-in. grinding

wheels. The distance between wheels is 162 in. and the height to center of spindle is 6¾ in. Net weight is 60 lb.

Coolant Filter

SAID to offer effective filtration, simplicity of operation and ease of emptying, a mobile machine tool coolant filter has been added



to the line of oil and coolant clarification equipment manufactured by *Honan-Crane Corp.*, 910 Sixth St., Lebanon, Ind. The unit is mounted on four 8-in. caster wheels for maximum mobility, is powered by its own motor and vacuum pump, and operates on a continuous circulation arrangement from a suction hose through the filter tank and discharge hose. Flow rate is 12 gpm. Coolant is processed in the machine sump. The entire unit will tilt at 45° angle on back wheels and auxiliary legs to facilitate emptying. The only controls are starting and stopping switches.

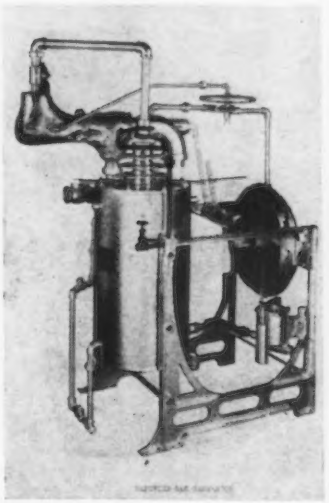
Radiation Pyrometer

DEVELOPMENT of a new Pyro radiation pyrometer which determines temperatures above 1000°F by thermo-electric principles, has been announced by *Pyrometer Instrument Co.*, 103

Lafayette St., New York. The instrument is selfcontained, weighs less than 2 lb, is direct reading and requires no outside connections, lead wires, batteries and accessories. Pyro radiation is completely automatic. In operation, it is only necessary to sight the instrument at the object being measured, and read the temperature on its direct reading scale. An indicator locking device holds the pointer at the reading obtained and is released by push button.

Gas Generator

AN improved compact unit said to produce safe, low-cost gas from fuel oil for all types of industrial ovens and furnaces has been announced by *Vapofier Corp.*, 10316 S. Throop St., Chicago 43. Foolproof alignment of parts, and less weight are the advantages gained by a new streamlined, cast aluminum chassis. The unit automatically maintains constant manifold pressure and air-gas ratios from a reducing to an oxidizing flame, it is reported. It can be used as a gas "standby" because of its quick switchover to gas without in-



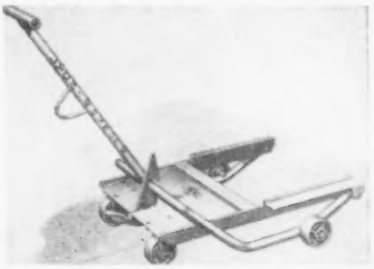
terruption of flame or change of flame quality. Gas produced has low hydrogen content.

Spray Booth Coating

FOR use on the walls of paint spray booths, *Detrex Corp.*, Box 501, Detroit 32, has developed a coating compound for use on both wet and dry booths. Known as Triad PRD this coating is a light-colored, semi-liquid material that is applied with spray gun. For spraying, a 20 pct dilution is said to produce a viscosity that can be handled in a pressure tank. This material can be brushed on as it comes although it is said a 10 pct dilution with water provides better consistency. The coating dries and forms a continuous white coating to which paint overspray adheres. It may be removed by scraping or by flushing with hot or cold water. Paint overspray adhering in a solid film can be peeled off in a sheet.

Tote Pan Lift Truck

ON the tote pan lift truck introduced by *Lyon-Raymond Corp.*, 4578 Madison St., Greene,



N. Y., open forks engage the side handle or lip of tote pans and lift the load by a downward lift of the operating handle. Elevation is accomplished by the principle of mechanical leverage using the handle as a lever and the rear wheels as a fulcrum. The truck has a capacity of 600 lb and is designed of tubular and formed steel parts. An automatic lock holds the load in the elevated position and a pedal release controls lowering. Movement is facilitated in cramped quarters with two swivel casters.

Phase Rotation Indicator

FOR industrial plant electricians, manufacturers of electrical equipment and others who require a means of determining phase sequence, the *H. H. Sell*

Electric Co., 1907 Willow Ave. North, Minneapolis 11, has offered the Selco phase rotation indicator. The instrument is recommended for phasing out new equipment such as transformer banks and alternators for parallel operations, re-establishing disrupted service with power of proper phase se-

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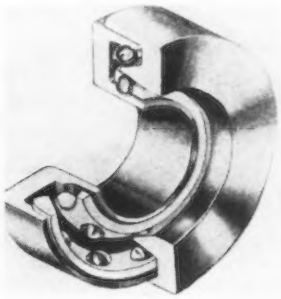
quence, installations of motors and condensers, and establishing proper starting and running circuit of controllers. It is also recommended for power outlet in factories where portable equipment such as welders are used. This instrument is said to indicate phase sequence as established by Electrical Engineering Society, by numerical, alphabetical, color coding and CW-CCW methods.

Heating Torch

EIGHT hours' burning time, 3800°F operating flame and hand-size convenience are some of the features of the Crown Torch, a self-contained heating torch announced by *Sully Engineering, Ltd.*, 7416 Melrose Ave., Los Angeles, Calif. The torch, which burns Butane or Propane gas, is designed for soldering, brazing and heating operations. Made of 16 gage seamless brass tubing, the torch has a pressure capacity of 2200 psi. Operating pressure with Butane and Propane gases is 90 to 150 psi. It is 12 in. long, 2¼ in. in diam and weighs 2½ lb when full. Other features include fingertip control of flame size and temperature, and an all-in-one tip.

Anti-Friction Bearing

ANTI-FRICTION bearings of the angle and radial types have been developed and patented by *Pal-Vin Machine & Mfg. Co.*, 1415 E. 40th St., Cleveland. The load is said to be distributed substantially throughout the entire circumference of the bearing. In-



creased load sustaining capacity is afforded by multiplying the rows of rotating bearing elements built into the bearing. Patents include not only bearings of multiple ball type, but also multiple pin, multiple roll, combination pin and roll, ball and roll and oil combinations.

Deep Hole Inspection Light

FOR inspecting, in quantities, the bottom and sides of small deep holes in machined or cast parts, a light has been developed by *Extractor Corp.*, 25743 W. 7 Mile Rd., Detroit 19. It is said that good visibility is readily obtained in holes ⅛ in. diam and 6 in. deep; ¼ in. diam and 30 in. deep. The design is such that the operator looks down the center of the light beam into the hole. The light is made in two forms: a portable light for inspectors and a bench light for multiple inspection.

Lubricated Plug Valve

HYDRO-LUBE, a plug valve designed to provide positive circulation of lubricant, has been introduced by *Pittsburgh Valve & Fittings Corp.*, Barberton, Ohio. In this design, lubrication is provided by hydraulic force each time

the valve is opened or closed. It is said the system is so arranged that lubricant ducts are not exposed to the line flow. Gaskets and stuffing boxes are not utilized. The valve is held in position by a bushing in the bonnet. At present, the valves are produced in sizes 1 to 4 in. screwed end and 1 x 4-in. flanged end for 175 lb pressure.

Magnetic Separator

A LOAD-RELEASING, lightweight, adjustable hand magnet of the permanent type has been introduced for rapid handling of steel by the *Multifinish Mfg. Co.*, 2114 Monroe Ave., Detroit 7. Self-powered and requiring no current, wires or batteries, the unit is operated with one hand and lifts up to 15 lb. It instantly releases its load when a finger-tip lever is raised. Within the moisture-proof aluminum and stainless steel case are two 4-in. Alnico magnets which, it is stated, will not lose power, regardless of kind or length of use.

Impact Nut Setter

A PORTABLE electric torqueless, impact nut setter which drives a nut or bolt 1750 rpm at free speed has been made available

by *Illinois Gage & Mfg. Corp.*, 4639 W. Washington Blvd., Chicago 44. At point of resistance, impact unit is said to deliver 3000 impact blows per minute. The unit may be reversed for removing bolts and nuts. It is equipped with 25 ft of cord with ground wire and operates on 110 v, 60 cycle, ac or dc circuit.

Odorless Inhibitor

DEVELOPMENT of Inhibitor No. 9, a liquid inhibitor that dissolves readily in acid solutions, has been announced by *Enthone, Inc.*, 442 Elm St., New Haven, Conn. The manufacturer states that this inhibitor is important where exhaust ventilation is not available. Another feature is its inhibiting action in both hydrochloric and sulfuric acid solutions. It dissolves cleanly in the acid solution leaving no sludge or residue, and is suitable for use in both cold and hot pickles. Steel coated with scale, oxide, and rust can be quickly pickled without attack upon the base metal, it is reported.

Overhead Crane

THE handling and loading of scrap can be speeded up, it is claimed, with a new 10-ton capacity overhead crane manufactured by *Harnischfeger Corp.*, 4400 W. National Ave., Milwaukee 14. Of all welded construction for greater strength and lighter weight, the P&H crane has a 95-ft span and is magnet equipped.

REVERE COPPER and COPPER BASE ALLOYS For Use With LIQUID OXYGEN

★ ★ ★

COPPER and its alloys have long been favored by metal fabricators as materials of construction for pressure vessels, distillation columns, heat exchangers and other equipment for chemical plants. The ability of these alloys to be readily formed and easily joined by conventional methods, coupled with their good mechanical properties and high corrosion resistance, have made them preeminent in many applications.

However, the manufacturer of oxygen producing or handling equipment must consider more than the above-mentioned properties. He must insist that the materials used be immune to any adverse effects low temperatures may have. Many commercial alloys become increasingly brittle and lose their ability to withstand sharp blows as the temperature drops. But here again, there need be no worries with respect to copper and its alloys. Note the improvement at low temperatures in strength, ductility *and* resistance to impact for three copper base alloys:

Alloy (Annealed)	Temperature, °F.	Tensile Strength, psi.	Elongation, % in 2 in.	Impact Resistance—ft/lb, Izod Specimens
Deoxidized Copper	Room	31,400	48	43
	—292	58,000	58	50
Cupro Nickel, 30%	Room	70,800	41	90
	—292	112,700	51	97
Cartridge Brass, 70%	Room	51,100	49	66
	—292	73,500	75	79

(Tests on 0.25 in. diameter specimens)

Other Revere alloys, such as Herculoy (High-Silicon Bronze, A) show similar excellent properties at depressed temperatures.

Therefore, in designing oxygen plants, to play safe, specify copper-base alloys. Revere's Technical Advisory Service will be glad to assist in the selection of the proper alloys to meet your requirements.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

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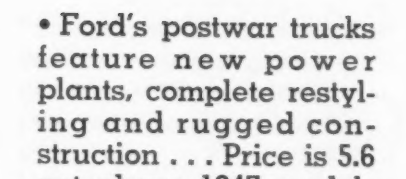
Assembly Line . . . WALTER G. PATTON

• Ford's postwar trucks feature new power plants, complete restyling and rugged construction . . . Price is 5.6 pct above 1947 models . . . FAA's strike at Hudson fails to win union recognition.



DETROIT—As the first product of the revitalized and greatly expanded Ford ("We're going places") Engineering Dept. the new line of Ford trucks recently introduced has attracted considerable attention of automotive engineers who hope to find indications in the new truck line of what to expect in the new passenger cars Ford will introduce during the next few months.

If curious auto engineers saw nothing else in the new Ford line they found evidence that Ford engineers have been energetically designing trucks that are sturdier, better engineered and better styled than any previous Ford products. They also found a range of models engineered to fit the individual requirements for many industries. And, if they took the trouble to examine the literature Ford is going to send out to prospects, they found conspicuously displayed Ford's documented claims for longer life, trouble-free service and low cost operation.

Considerable emphasis is placed on the fact that the trucks are entirely new and that they are engineered to meet specific truck industry needs; the days when a competitor can refer to Ford trucks as "converted passenger cars" seem definitely at an end.

Three new power plants are available in the new Ford series—a new 95 hp six, an improved 100 hp V-8 and a new heavy duty 145 hp V-8. Some sources believe the gap in available engines will be partially closed when the new Mercury (believed to be 120 hp) is introduced within the next few months.

Weather-proofed ignition systems with automatic spark control are featured in all powerplants.

An outstanding characteristic of the new Ford truck line is that it is ruggedly — but modernly styled to look like a truck. The radiator grille and headlights are recessed in a modern front end to give an appearance of massiveness. Fenders are heavier than previous models and a new and stronger fender suspension has been provided. A heavy channel-steel front bumper is attached directly to the extended frame side rails to give greater rigidity and impact strength.

Cabs provide up to 7 in. more width and headroom has been increased. The one-piece windshield is larger and the rear window area has also been increased. Weatherproofing has been improved throughout the cab and the hardware is heavier and sturdier than the hardware used on 1947 models.

Seats and cushions are designed to give increased driver comfort. "Siralounge shock-absorber seats" built by Monroe Auto Equipment Co., in which the seat floats on a variable-rate spiral coil spring, are available in cab models. These seats can be adjusted to the driver's weight. A new three-way air control system provides high volume, fresh air ventilation.

Steering ratios have been increased to provide easier handling; 2-ton models and over are equipped with vacuum power brakes that boost foot pressure over 100 pct.

In its light duty models, Ford is using bigger fender supports, a heavier and wider running board and larger body brackets. A new straight-through muffler is specified to decrease back pressure and give better engine performance. New telescopic double acting shock absorbers are used, front and rear and completely sealed. The 45x2 in. springs have hardened steel pins and steel-backed bronze-bushed eyes. The frameside members have a depth of 5.92 in., width 2.25 in. and thickness 0.15 in.

REMOVABLE brake drums have a cast iron surface fused to a steel back. The I-beam front axle has been redesigned.

The new Ford Six engine has a 73 lb cast alloy crankshaft with four main bearings and seven counterweights. The block is Ford alloy iron. Connecting rod bearings are steel-backed, copper-lead. Aluminum alloy pistons are plated and have 4 rings, 2 for compression and 2 for oil control. Other features include a simplified generator mounting and belt adjustment; a new metal clad ignition coil; pressure valve radiator cap; and a packless-type water pump. Exhaust valve seat inserts are cast chromium-molybdenum steel. A high turbulence combustion chamber is designed to concentrate fuel around the spark plug and minimize spark knock.

Additional features available on Ford heavy duty trucks include 15x3½ in. rear brakes with inspection holes in the brake drums and a heavy duty, 2-speed full floating Quadrax rear axle. Twenty-inch dual wheels have 2-piece wide base rims with a 5° tapered bead seat. The radiator is a flat tube, fin type.

The new Ford V-8 cast crankshaft weighs 69.2 lb and has dual oil holes in each crankpin for connecting rod bearing lubrication. Connecting rods are individually locked in and have removable type steel-backed copper-lead alloy bearings. Other engine features are a high turbulence combustion chamber, 4-ring aluminum pistons, one-piece valve guides and full-floating tubular-type piston pins. The new V block incidentally is shorter than the 1947 model.

Axles for the new Ford heavy duty models are made of manganese steel 1.75 diam. over the splines. The axle flange is a forged, integral part of the axle. The pinion is straddle mounted and roller bearings are used throughout.

In its extra heavy duty models Ford is using a 9 in. channel frame with 3 in. flanges and jaw and channel type cross members. Single speed and 2-speed hypoid axles are available. Axle shaft diameter at the spline is 1.87 in. Twenty-inch dual wheels with wide base rims and 5° tapered bead seats are specified.

The forged crankshaft of the 145 hp engine weighs 90 lb and has three main bearings and six counterweights and hardened crankshaft journals. Hydraulic valve lifters and shot-blasted and rustproofed valve springs are specified. Exhaust valves are faced with a cobalt-chrome alloy. The top piston ring is chrome-plated.

A brake inspection hole permits feeler-gage check of brake adjustment and visual inspection of lining wear. Brake drums which are removable, and can be bought separately from hubs, are available for replacement.

List prices of the new 1948 models range from $890 for the six-cylinder ½-ton chassis and cowl to $2135 for the cab-over-engine 2-ton 8-cylinder stake truck. Compared with 1947 models, the average price increase is 5.6 pct. List prices of the new 2½ and 3-ton models range from $2485 to $3430.

* * *

WHAT looked to many observers like Operation Dying Gasp of the Foremen's Assn. of America in Detroit has ended in a draw. The recent 9-day work stoppage at Hudson by 550 foremen has resulted in a compromise agreement without recognition of the union as the bargaining agent for Hudson foremen.

According to Hudson management, the company has agreed to bargain collectively with its supervisory employees but has not agreed to bargain with FAA. However, even here no comprehensive contract has been drawn up, it is reported.

The Hudson strike began Jan. 13 following a ruling by the Michigan State Labor Mediation Board that under the Bonine-Tripp Act FAA could not be recognized as the bargaining agent for Hudson foremen. It is significant that FAA officials are not claiming recognition.

Company officials admitted that the foremen strike had slowed down production. At one stage of the strike, the Hudson assembly line was down although parts production was maintained during the absence of supervisors.

It seems evident that Detroit foremen have learned something about tactics since their dismal failure in the Ford strike. At the Rouge plant, FAA telegraphed its punch weeks in advance, giving Ford an opportunity to plan against the eventuality of a walkout. When the walkout came, Ford preparation paid off and production was held close to prestrike levels.

The Hudson strike was pulled with almost no warning; this left little opportunity for management to prepare for the walkout in advance.

Informed sources here see both a warning and a source of satisfaction in the recent Hudson strike. That is to say, organized foremen can, without apparent legal restriction, pull a strike with lightning rapidity. However, there is no indication that other organized labor groups will walk out in sympathy with them. More important, there are no indications that the foremen themselves care much about affiliation with an outside organization. This was clearly demonstrated in the strike at Ford and has been demonstrated again in the case of Hudson.

As matters stand now in Detroit, Hudson and Packard are bargaining collectively with their foremen who are unaffiliated with FAA. FAA still has a contract with Kaiser-Frazer and a few scattered parts manufacturers. It looked like FAA might continue in business here for a while—but its rations would be pretty slim.

Electric Motors Being Put to Some Unusual Functions in Planes

Pittsburgh

• • • **Use of electric** motors in aircraft is expanding their variety and the type of job they do. One runs inside gasoline tanks, another in propeller hubs. Westinghouse, in a review of developments, also discloses production of one that develops 9.24 hp at 27 v. It runs at 3600 rpm to drive an air-conditioning compressor on one of the big commercial airliners. It weighs but 53.5 lb. (A standard, open 10-hp, 3500-rpm dc motor weighs 255 lb.) It is explosion proof, with a ventilating system of its own by which air is drawn from the outside and vented to the outside.

Indicative of the unusual tasks to which motors are sometimes put in aircraft is one of 1/3 hp mounted within the hub of a whirling propeller and used to vary its pitch should the hydraulic pitch control fail. The motor is submerged in oil, runs at 11,000 rpm, and operates on 400 cycles. Centrifugal forces subject it to stresses as high as 400 g.

About 2 years ago a family of standard, general purpose dc motors was developed especially for airplane use. These have been directly applicable to many jobs, thereby achieving the various benefits of standardization. In some cases only minor modifications have been required to match the standard motor to a particular job.

For example, by providing a 3⅛-in. motor with a special bracket, one pump manufacturer was able to build within the wing tanks supplemental fuel pumps submerged in and cooled by the gasoline itself. The motor operates at either of 2 speeds. For normal pumping it turns at 6500 rpm and delivers 1/6 hp. During take-offs, and in case of main pump failure, it runs at 9000 rpm with double the power output. The same motor, with a gear, drives a pump to transfer gasoline from one tank to another while in flight.

The 4-in. standard motor is being adapted to develop 0.6 hp as a fuel-pump drive for the jet engines in P-45's. A smaller motor (it is 2 5/16 in. in diameter and develops 1/50 hp on 12 v) with a built-in brake and 434:1 speed reduction is used to control a wing flap.

A self-regulating motor-generator set has been developed to supply two closely-regulated voltages for a highly accurate, radar-type altimeter. The set with its carbon-pile regulator delivers 12.8 and 270 v with less than 5 pct plus or minus deviation for any impressed voltage between 19 and 30 v. This insures instrument accuracy regardless of the output of the plane's 24-v system.

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Washington . . .

EUGENE J. HARDY

• New "cure-all" for industry now in distillation stage . . . Senator Murray's plans for RFC financing of expansion slowed by lack of capacity data.

WASHINGTON — Critics of the steel industry are writing another legislative formula designed to tell steel leadership how to run its business.

The latest so-called remedy—now in the planning stage on Capitol Hill, in the departments and agencies, and in privately-financed research organizations—is to bear the name of Senator Murray, D., Mont. Mr. Murray has long been an advocate of huge increases in steelmaking capacity.

Curbstone advice on what's supposed to be wrong with the industry—and what the industry ought to do—comes packaged in large, economy-size containers and is available at your nearest government bureau.

So Mr. Murray, with the unnecessary prodding of the CIO and some government economists, is distilling his own brand of industrial cure-all in the hope of cashing in on a ready market of labor votes.

Both public and private researchers are hard at work on the Murray program. So far, the Commerce Dept., the Agriculture Dept., the Council of Economic Advisers and the Public Affairs Institute are involved. The latter organization is privately-financed.

"Expansion on the scale necessary is just not being met," according to one of the Murray planners. "And, in comparison to needs, the announced expansion program does not even begin to pick up the backlog of demand. We're getting ready to say something and will put our ideas out in the form of a study." The "study" probably will be released simultaneously with introduction of Senator Murray's proposed bill on government-financed expansion.

THERE are four well-defined steps in Mr. Murray's nostrum to increase capacity via the government subsidy route.

First, government agencies would be required to inaugurate a continuing study of steel supply and demand. Such knowledge, he believes, would be the "key to maintenance of full employment, foreign rehabilitation and world peace."

Second, results of these studies —presupposing a conclusion showing supply and demand to be out of balance—would be forwarded to Congress by the President.

Third, public funds from government lending agencies such as RFC would be made available to members of the industry for expansion purposes. Mr. Murray suggests a low rate of interest and suspension of interest payments if operating rates fall below certain levels.

Fourth, if the third method is not acceptable, public funds should be made available for construction of government-owned plants leased for private operation.

"As I conceive the problem, there can be little doubt that steel capacity is inadequate to meet the twin needs of a full employment economy and American obligations in a war-stricken world," he says.

Mr. Murray has been talking about his program for at least a year. His ideas still are far from the point of introduction as a Senate bill. Chances are that they will remain stymied for a time, for the Murray office is just discovering a truism known to the industry for more than a century; namely, that you can't forecast steel capacity unless you know in advance what steel demand will be.

SO, Mr. Murray finds that his divining rod isn't any more reliable than the next man's. After several months of prodding around in the maze of currently available steel statistics, his researchers came up with this report: "Steel companies are tight with their data and we think their figures are questionable in some respects. And the CIO assertions may or may not be colored with self-interest."

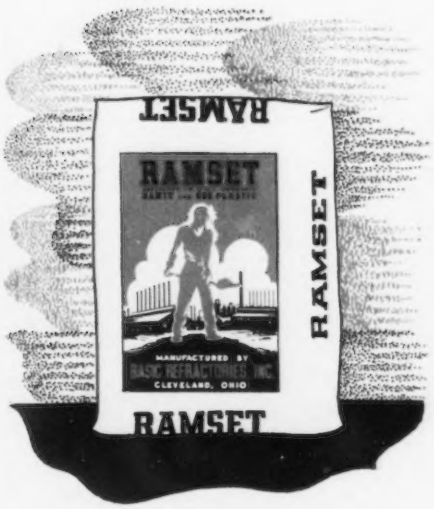
Frustrated in this direction, the Murray staff next turned to the so-called businessman's thesaurus of industrial information —the Commerce Dept. Commerce coyly said it didn't have any idea what steel demand would be in 1950 or any other year. This rebuttal caused one Murray spokesman to sniff that if a farmer could ask the Agriculture Dept. what wheat production would be next year, he'd get an official prediction. Why, he said, couldn't the Commerce Dept. then give him a prediction as to future steel demand?.

Actually, the Commerce Dept., under the direction of steel expert R. M. Weidenhammer, is conducting a continuing study of demand. But the first results of this study will not become available until mid-1948, at the earliest. This date, Mr. Murray felt, was too long to wait.

NEXT he turned to the President's Council of Economic Advisers, headed by Dr. E. G. Nourse. The advisers turned the problem over to their staff, who mulled the idea over for a few weeks and then told Mr. Murray they didn't know the answer

NO HYDRATION IN RAMSET* BOTTOMS

even after 5-year shutdown!



RAMSET

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IT was necessary, recently, to break up the Ramset bottoms in five open hearth furnaces, to permit removal of the structural steel and brick for erection at a new location.

When the bottoms were cut through with air-hammers, the Ramset was revealed in excellent condition, dense and well bonded. There was no evidence of hydration, even though the plant had been inoperative since 1942. No steel had ever been made on three of the bottoms.

The unretouched photograph below shows the Ramset from No. 1 furnace which had produced 186 heats. The loosened surfacing material is maintenance refractory which had been wet by the dismantling crew to lay the dust.

The picture above shows the strongly monolithic nature of the Ramset, with the imprint of steel taphole pipe and brick corbelling undisturbed by removal.

The excellent and lasting refractory properties of Ramset have been proven in service over a ten year period in more than 600 open hearths and electric furnaces.

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either and furthermore, they were too busy to find out.

This left the problem, so far as Senator Murray was concerned, largely up to the Public Affairs Institute, a research organization headed by Dr. Dewey Anderson, former director of the Senate Small Business Committee. The institute admits that preparing a bill of the sort asked by Senator Murray "is one of the hardest kinds of bill to write."

One of the few things the Murray planners have agreed upon is that RFC should put up the money for the forced-expansion proposal. As for how large a sum of government funds should be made available for expansion purposes, they are in disagreement. Until recently, they were talking about a $4 billion kitty. They have now discarded this figure. Heavy exports of steel and its products under the European Recovery Program might necessitate upping this figure, they believe.

Actually, Mr. Murray's group apparently has overlooked the single government prediction on future demand made in recent months. The look-ahead is contained in the report of Interior Secretary Krug on national resources and foreign, published in October 1947.

Mr. Krug, in taking stock at that time as to what the United States could spare in the way of resources for European rehabilitation, said that total domestic and export demand would reach 71 million tons by 1952. A total of 96 million ingot tons would be required to turn out steel mill products, he estimated. Mr. Krug's estimate is shown in the accompanying table.

Introduction of the Murray bill, therefore, still is some weeks off. But not too far off. Congress will bust its buttons, if necessary, to adjourn before the opening of the Democratic and Republican national conventions in June. And Senator Murray's formula—whether it can withstand the tests of debate on industrial practicability or not—will be offered with all the fanfare the CIO can muster when the Montana lawmaker rises from his chair in the Senate to begin, "Mr. President, I ask unanimous consent to introduce . . ."

Estimated Production, Exports, and Domestic Demand for Steel Mill Products, 1947-1952

(Millions of Short Tons)

	Production at current rate	*Maximum production from present ingot capacity*	*Imports*	*Total Demand*	*Domestic Demand*	*Export Demand*[1]	*Ingots required for domestic and export demand of steel mill products*	*Present ingot capacity*
1947	63	67	[2]	65	58.4	6.6	88	91
1948	63	67	[2]	66	59.4	6.6	89	91
1949	63	67	[2]	68	61.4	6.6	92	91
1950	63	67	[2]	69	62.4	6.6	93	91
1951	63	67	[2]	70	63.4	6.6	95	91
1952	63	67	[2]	71	64.4	6.6	96	91

[1] Based on current export quantity; any increase or decrease will have a corresponding effect on the total demand-supply situation.
[2] Negligible.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

SURE, I HAD A HARD TIME GETTIN' USED TO STORE TEETH-- BUT I WASN'T FOOL ENOUGH TO GET BIFOCAL SPECS AN' ARCH SUPPORTS AT TH' SAME TIME!
YOU THINK OTHER PEOPLE'S TROUBLES CAN'T BE AS TOUGH AS YOURS, SO YOU GO 'ROUND TRYIN' TO FIND HOW IT WAS SO EASY FOR THEM!
TH' TRUTH IS SHORTY COULDN'T AFFORD TO GET 'EM ALL AT ONCE --HE HAD TO SAVE UP FER EACH ONE -- NOW HE GLOATS!
1-30 J.R.WILLIAMS
THE EXAMPLE
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Plant Hits Postwar Peak Of 54 Box Cars Per Day

Chicago

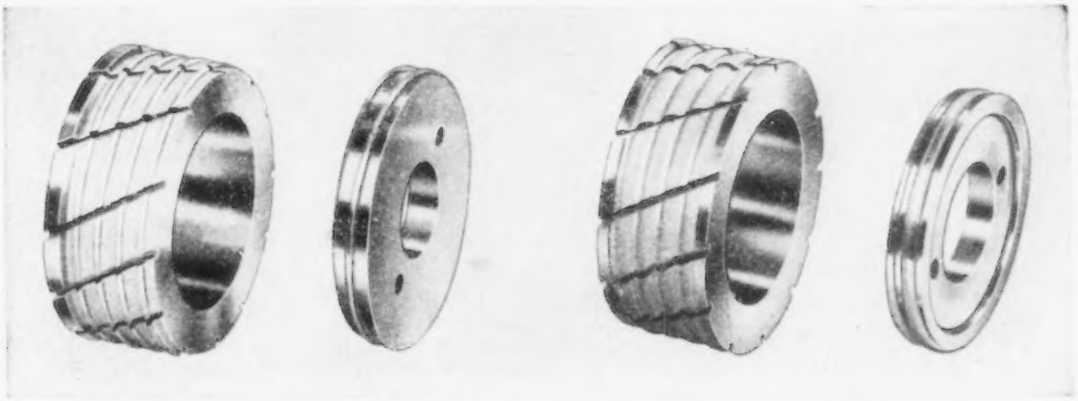
• • • **The Michigan City,** Ind., plant of Pullman-Standard Car Mfg. Co. is now turning out all-welded P-S-1 "package" box cars at the rate of 54 a day, or one every 10 minutes of the working day. Production of 54 cars a day on two assembly lines marks a new postwar peak in output at the Michigan City plant.

"Most of the component parts are engineered and built by Pullman - Standard," Wallace N. Barker, executive vice-president, stated. "That means that with the Michigan City backlog now consisting largely of P-S-1 cars, there should be less time lost on the production lines as a result of change-over."

SHEFFIELD MACHINE TOOL DATA

MFG #111

CRUSH GRINDING CUTS MANUFACTURING COSTS OF SMALL AND LARGE SCREW CAP FORMING ROLLS



From left to right - (1) Crusher roll for truing the grinding wheel used to produce the internal die; (2) The resultant internal die; (3) Crusher roll for external die; (4) The external die.

The inner and outer rolls or dies used to roll the thread on jar lids have heretofore been made by chasing on a lathe with a tool formed to the desired thread profile. The rolls are then heat treated and polished. Distortion of form occuring in heat treating is a common cause for rejects.

This problem has been eliminated, production time greatly reduced and uniformity of quality assured by the following methods:

(1) Crusher rolls to desired thread profile are made on standard H.S.S. blanks with the Sheffield Micro-Form Grinder.

(2) The resultant crusher roll is used to dress a 120 grit wheel on the Sheffield Precision Thread and Form Grinder

(3) This Sheffield Precision Thread and Form Grinder is then set up to grind the dies in quantity with two passes of the grinding wheel over the work.

While it was possible to produce the form in a single pass at reduced work speed, the most desirable combination of production time and product finish was obtained by taking two passes, one for rough grinding and one for finish grinding.

In grinding, two parts were placed on an arbor. Total grinding time per part was slightly under 4 minutes. Approximately an hour's labor per die is saved by using crush grinding on Sheffield equipment, and the die so produced is more uniform in quality and the finish is better.

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West Coast . . .

ROBERT T. REINHARDT

• New breakdown mill for Seattle producer is rumored . . . Magnesium foundry to open soon in Renton, Wash. . . . Geneva taps additonal ore source . . . Perambulating population builds lusty trailer business.

SEATTLE — This area which breeds rumors of new steel plants, blast furnaces and rolling mills almost as rapidly as it produces the famed Olympic oyster, last week developed some talk which apparently has basis in fact, although it is denied by the principals.

It is known that Isaacson Iron Works here, which operates two electric furnaces each with a rated capacity of 40 tons per heat, and produces ingots, billets, forgings, fabricated structural steel, marine hardware, tractor and logging equipment, has contacted rolling mill designers to determine the possibilities and costs of designing and building a breakdown mill.

When interviewed, Henry C. Isaacson, president, told THE IRON AGE that his organization had no such plans and that the project was still in the talking stage within their organization. When questioned as to whether this proposed mill might possibly tie up with the project announced last year by the Seidelhuber Iron & Bronze Works involving construction of a sheet mill, Mr. Isaacson said, "No, that is ony in the talking stage, too."

Isaacson has been producing ingots in excess of its finishing facilities for the past year and is shipping considerable tonnages of ingots to England. In the interview, the company president stated that under the Marshall Plan or any other aid-to-Europe program, iron and steel would have to be shipped to England and that it might as well go from his company as from any other source. He reported that the contract for these ingots was continuous and that so far as he knew no effort was being made to stop these export sales.

Other steel producers in the Pacific Northwest, and some mills with excess finishing capacity who had been purchasing ingots from Isaacson until that company secured its foreign contract, are unhappy about the whole thing. Isaacson is reportedly selling ingots abroad for approximately $83 per ton which is more than local finishers are willing to pay. Some off-grade ingots reportedly have been offered at $72 a ton which is still considered high.

This export business has brought Isaacson into the scrap buying picture too heavily to suit other producers in the area as the purchases of this company have strengthened the scrap market considerably and, according to some observers, is responsible for moving the price to its present figure of approximately $26.00 per ton for No. 1 heavy. This same price is often paid for out-of-town scrap and by the time it is brought into the mills at Seattle and Portland, the figure approaches $30.00 per ton.

SEIDELHUBER IRON & BRONZE WORKS continues to talk about its proposed 60-ton per day capacity sheet mill, producing sheets up to 26 in. wide, and it is known that ingot supply is one of the bottlenecks in developing this project. Both Isaacson and Pacific Car & Foundry are potential local sources of ingots and there is a good chance that one of these companies will find it advantageous to put in the breakdown mill necessary to supply the sheet bars for this operation and sell surplus bars elsewhere.

If Seidelhuber should decide to put in its own melting facilities capable of producing 60 tons of ingots per day, it would probably run up against the shortage of electric power now serious in this area. It has been estimated that power to operate such an electric furnace would cost about $3 per ton of steel produced from scrap.

A shortage of steel sheets has cut Seidelhuber production from 250 water heater tanks to 100 per day. Improved deliveries recently indicate that by April they will again be back to normal production and that after the new rolling mill is in operation they can hit a peak of 400 to 500 tanks per day. Eighty men have had to be laid off within the past few months because of the cut in production.

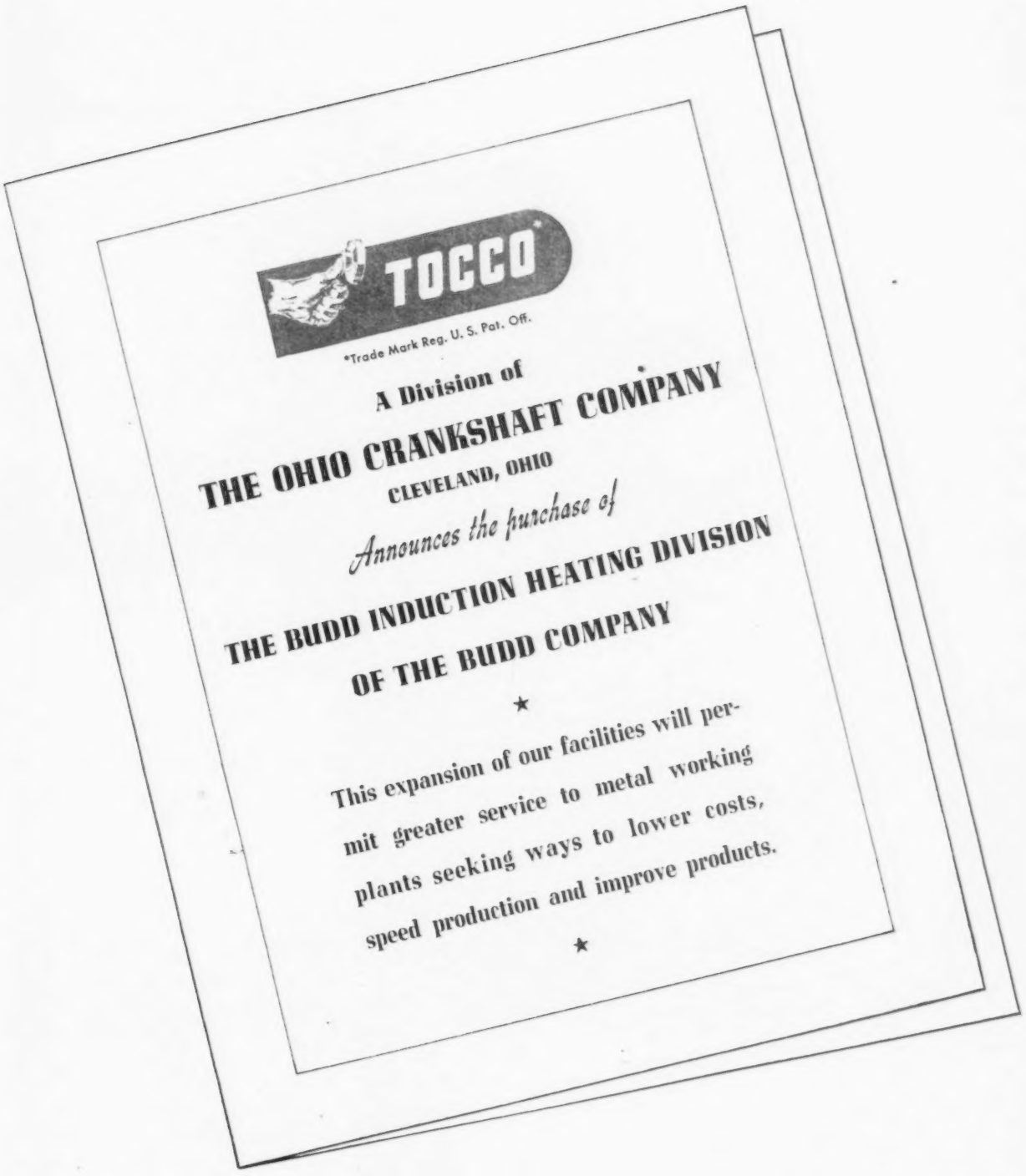
WHILE most foundry owners in the Northwest are complaining about a business slump which has lasted for 5 or 6 months, James C. Morley is opening up a new foundry to be known as the Morley Magnesium Foundry, Inc. at Renton, Wash. near here. As first announced in THE IRON AGE of Nov. 13, p. 112, Mr. Morley is planning first of all to produce between 35 and 50 magnesium cable drums which will be tested in the field. According to Mr. Morley, his organization has lined up enough business to keep the foundry operating on two shifts after June 1.

"We hope to have limited production," stated Howard Clow, vice-president and office manager, "by Mar. 1. By June we should be in full production and at that time we will be operating two shifts with from 20 to 40 men on each shift, and there is a good chance that we may have to go into third shift operation."

The new company has taken over the plant of the Pacific Coast Coal Co. and additional facilities are being constructed. The foundry itself will be of steel frame and have sheet metal covering. In addition, there will be a warehouse, a heat treating building, a cleanup building and an office building made of concrete blocks. A pattern shop and small machine shop will be located in the foundry building.

Other products to be manufactured here include construction wedges, trailer parts (wheels, brake drums); sky hooks for logging operations; pallet boards for the manufacture of concrete blocks; and other castings.

Much of the equipment for the new foundry has been purchased from the Pullman Northwest Co., Pullman, Wash. Equipment includes five pot furnaces, four of which will be used for general oper-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ation; and a continuous flow furnace, 700 lb melt, which will pipe the metal through a special tubing to the mold. Furnaces are placed above each other so that there will be a gravity feed.

"We are trying to get away from as much physical handling of material as possible," Mr. Clow stated.

The company is going after business on a national scale under the direction of Mr. Morley and William Cowell will be plant superintendent.

E. B. Parker, director, division of industrial services, Washington State College, who has been directing experimental use of magnesium for many years and is considered a national authority on the subject, recently stated:

"Magnesium alloy pig is now readily obtainable in any reasonable quantity. Properly applied with sound fabrication techniques, magnesium alloys are now definitely competitive with other metals in the casting field. It is a relatively new material highly adaptable to new applications and new developments."

Mr. Parker goes on to say, "Lack of sufficient knowledge and experience in the use of magnesium by designers and engineers to induce them to write it into their specifications is accountable for the slow acceptance. And most fabricators lack the specialized knowledge and experience necessary to the successful operation of a magnesium foundry, permanent mold, or diecasting plant." There are exceptions, he says, but, "the average engineer is reluctant to trust the success of his design to a material with which he is unfamiliar and which his local fabricators are unwilling to undertake."

This authority indicates that further education and training, both on the design level and use level are necessary and that the responsibility for this work falls upon educational institutions, research laboratories and producers of the materials themselves.

SALT LAKE CITY — Geneva Steel Co. improved its iron ore reserves position last week through lease agreements made by Columbia Iron Mining Co., another U. S. Steel Corp. subsidiary, and owners of two groups of claims in Iron County, near property already owned or leased by Columbia.

Claims held for many years by the Milner Corp. of Salt Lake City were leased on a royalty basis, an advance payment of $600,000 being made. Claims held by Arthur E. Moreton of Salt Lake City and associates were leased for an initial payment of $250,000. Additional payments will be made if the quantity of iron ore exceeds present estimates.

Steel ingot production at the Geneva plant is currently running at the rate of 100,000 to 105,000 tons per month. The controlling factor is still coal supply and this in turn is limited by railroad cars and housing for coal miners. The Geneva mine is producing at the rate of 5000 tons per day, 20 pct under the company's goal. The Columbia mine is producing at the rate of 1400 tons per day.

The company is currently building 120 new homes at Dragerton, the Geneva mine town, at a cost of $1,220,000. The housing problem will be pretty well taken care of when this construction program is completed.

New cars have been ordered but deliveries are not expected for several months.

A program to improve and increase housing facilities at the Columbia mine community is in the planning stage.

LOS ANGELES—Americans are historically perambulating people—whether on foot, by horse or wheeled or winged vehicle, they must move about. Trailer coach manufacturers have found this instinct makes good business and today approximately one million persons make their homes in trailers. About one third of these inhabitants of homes-without-roots live on the West Coast.

Southern California trailer coach manufacturers produce approximately 20 pct of the nation's trailers for which they receive about $20 million per year. This is big business with an annual payroll of $6 million being distributed among 2500 employees, according to an industry spokesman.

The trailer industry has emerged from the war era as a substantial and permanent enterprise in this area, although subject to seasonal influences as is the automobile industry in normal times. Trailer manufacturers in southern California are optimistic about the immediate future, which is visualized as a housing era, and the more distant future when trailer coaches are expected to be an integral part of America's travel and recreation plans.

Today, veterans in need of immediate housing are said to account for about 60 pct of the purchases of trailer coaches. Actual and potential nomads living in trailer coaches at the present time are broken down statistically by the Trailer Coach Manufacturers Assn. in this manner: 35.5 pct are production workers; 15.6 pct, sales and service workers; 15.4 pct are executives or professional people; 8 pct are retired individuals; 6.9 pct are construction workers; 6.6 pct work for the government; and 12 pct are unclassified.

Largest of the 36 manufacturers of trailer coaches listed by the Trailer Coach Assn. of California are reported to be: Westcraft, Inc., Mainline Trailer Co., both of Los Angeles; Kit Mfg. Co., Long Beach; American Trailer Coach Co., Monrovia; Columbia Trailer Co., and Masterbuilt Trailer Co., both of Glendale; and the Universal Trailer Co., Hynes. It is reported that all manufacturers of trailer coaches in the state of California have an investment of approximately $10 million in their plants.

* * *

A DETAILED statement issued by Kaiser Co., Inc., Iron and Steel Div., on its operations at Fontana, confirms the report first published in THE IRON AGE Jan. 8 to the effect that production records in all departments had been broken during 1947.

F. M. Rich, vice-president in charge of operations, released these figures, all given in net tons, last week: Furnace coke, 332,244; hot metal, 459,715; sinter, 355,575; ingots, openhearth, 795,728; soaking pits, 741,056; 36-in. mill, 594,053; finished plate, 188,202 (this is a postwar high whereas the all-time high was made in 1944 when 340,344 tons were produced); 29-in. mill billets and shapes, 289,346; merchant mill (including Skelp), 171,372.

Mr. Rich further states that all departments of the company's operations broke monthly records at least once and many of them as many as five times during the year.

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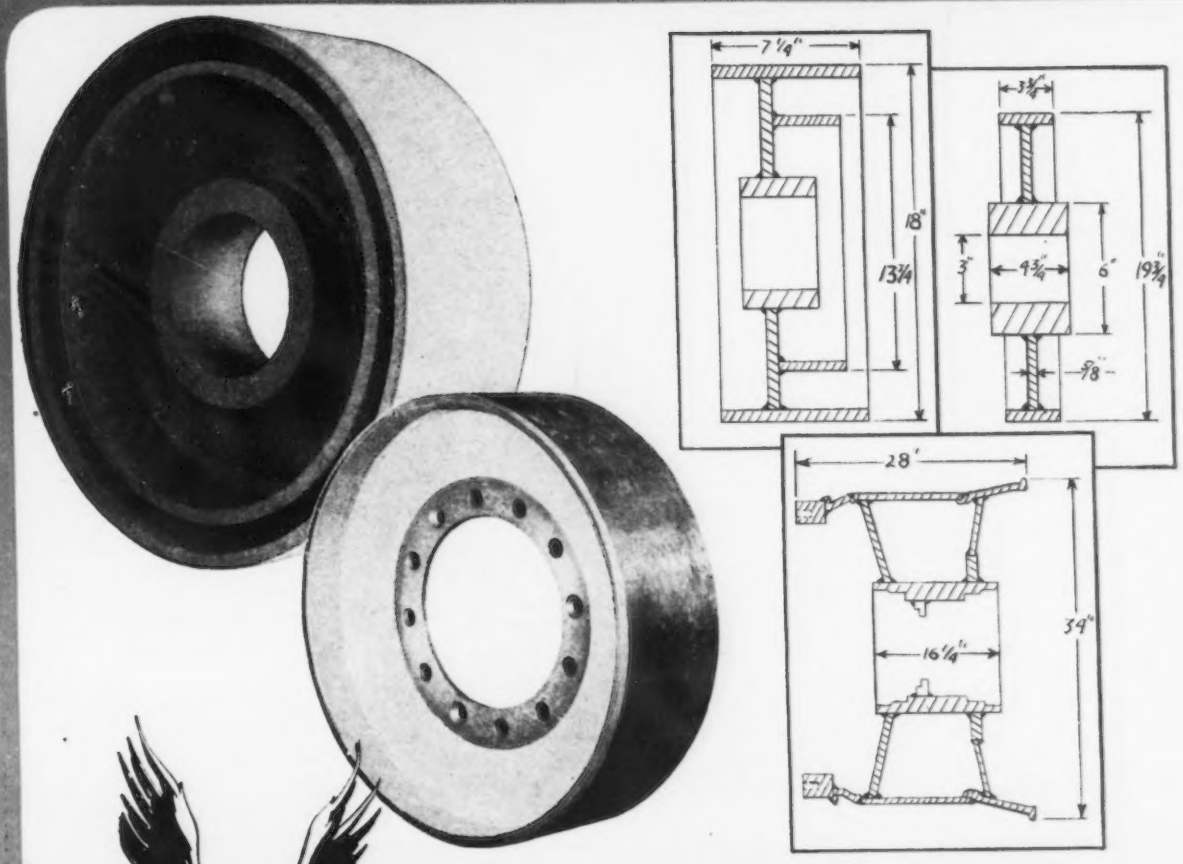

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PERSONALS

° ° °

• **Robert F. Johnston** has been named assistant general sales manager of Eastern Stainless Steel Corp., Baltimore. After 2½ years as buying officer for rolled steel products with the U. S. Navy Dept., Mr. Johnston joined Eastern in 1945 as sales service engineer. He was with Carnegie-Illinois Steel Corp. for 19 years prior to joining the Navy.

• **J. K. Sutherland** has been appointed vice-president in charge of sales of Benchmaster Mfg. Co., Los Angeles. He joined Benchmaster in July 1947.

• **E. E. Littler,** purchasing agent of the Anaconda Copper Mining Co., New York, has retired. He has been employed by the company for 48 years.

• **Michael Leyava** has been elected president, Ajax Steel & Supply Co., Erie, Pa. He started his steel business career 15 years ago with Otis Steel Co. and during the war was a scrap inspector in the Army and a deputy chief of the salvage and scrap section in the industrial division in office of Chief of Ordnance, Washington. He became Cleveland district manager, James Flett Organization, in 1946. **Garfield A. Jenkins** has been elected secretary of Ajax Steel. He was formerly assistant to Mr. Leyava at Flett and was previously with Jones & Laughlin.

• **Howard J. Wright** has been appointed to the board of directors and made plant manager of Quality Steels (Canada), Ltd., London, Canada. Mr. Wright was formerly chief chemist and metallurgist. **F. J. Allan,** formerly secretary-treasurer of Quality Steels, has been appointed sales manager of the company's newly-organized sales department. **George Reed,** formerly accountant of the company, has been appointed secretary-treasurer.

• **Hans E. Hansen** has retired as sales representative of the Washington division of Columbia Steel Co. Mr. Hansen had been associated with subsidiaries of U. S. Steel Corp. for 35 years, having begun his career in the steel business in 1913 in the Seattle office of U. S. Steel Products Co., which became a part of Columbia Steel Co. in 1930.

• **John A. Fellows** has been appointed assistant chief metallurgist at American Brake Shoe Co.'s research center in Mahwah, N. J. He is resuming his association with Brake Shoe after 2½ years' service in the atomic energy field and 1½ years' service with Union Carbon & Carbide Co.

JAMES D. GLENN, general manager of stainless steel sales, Crucible Steel Co. of America.

• **James D. Glenn** has been appointed general manager of stainless steel sales, Crucible Steel Co. of America. He first was associated with the Central Alloy Steel Corp. in Masillon, Ohio. In 1930 he joined the Associated Alloy Steel Corp., a sales organization for the stainless and alloy steel products of three companies, including Sharon Steel Corp. In 1933 when the Associated Alloy Steel firm was dissolved, Mr. Glenn joined Sharon Steel as assistant manager of sales of the stainless steel division. He became manager of stainless and alloy steel sales in 1937, and in 1944 was made assistant general manager of sales of the entire company. In 1945 Mr. Glenn joined Eastern Stainless Steel Corp., Baltimore, as vice-president in charge of sales. He comes to Crucible Steel from Baltimore, and will make his headquarters in New York.

• **L. George Mehler,** assistant superintendent, blast furnaces at Farrell works, Sharon Steel Corp., Sharon, Pa., has been appointed superintendent of blast furnaces, Farrell works. He succeeds **Philip E. Angle,** who has retired.

• **Edward F. Resch** has been appointed district sales manager in the Philadelphia sales area by the Sawhill Mfg. Co., Sharon, Pa.

• **William L. Lentz,** vice-president and administrative committee member of American Locomotive Co., New York, has added to his present duties those of **J. B. Ennis,** senior vice-president, who has retired. **Frank J. Foley,** former director and vice-president who has been serving as a consultant for the last year, has also retired.

• **George Keagy** has retired from the position of Hagerstown, Ind., plant manager of the Perfect Circle Corp. Mr. Keagy will retain his connection with the corporation as a member of the board of directors. **George Myers,** formerly assistant plant manager, has been named plant manager.

• **J. Howard Patton** has been appointed general manager of operations of all the manufacturing properties of Brainard Steel Co., Warren, Ohio. Mr. Patton has been with the company for the past 10 years in various operating capacities, most recently in charge of electric-welded tube manufacture.

• **P. K. Connelly** has been elected president of Weldrite Co., Inc., of Long Island City, N. Y., succeeding the late J. J. Dancy. Mr. Connelly has been secretary-treasurer of Weldrite Co., Inc., since 1922 and president of Prest-O-Sales, Inc. **Edward C. Madison** succeeds Mr. Connelly as president of Prest-O-Sales. As former vice-president in charge of sales, Mr. Madison has been associated with Prest-O-Sales since 1929.

• **F. A. Kraemer,** former sales manager of the jobbing division, has been named general sales manager of the West Bend Aluminum Co., West Bend, Wis., and **H. G. Schacht,** former sales manager of the retail division, has been made assistant general sales manager of the firm.

• L. B. **Smith,** vice-president and director of **A. O. Smith Corp., Milwaukee,** has been appointed general manager of the Kankakee works of that company. **H. F. Detrick,** who has held that post since the Kankakee works went into production, in addition to carrying on his former duties as president of the Smith Meter Co. of Los Angeles, a wholly-owned subsidiary of A. O. Smith Corp., will devote his full time to the further development of the Smith Meter Co.

• **John J. Howard,** vice-president of E. J. Lavino & Co., Philadelphia, has retired. He has been associated with E. J. Lavino & Co. for 32 years.

• **Earl J. Goris** has been appointed advertising manager of the Dearborn Chemical Co., Chicago. He was formerly in the advertising department of General Electric X-Ray Corp.

• **M. D. O'Leary,** who has been director of purchases and office manager for Chicago Vitreous Enamel Product Co., Cicero, Ill., since 1939, has been promoted to the position of works manager and assistant to the vice-president. Mr. O'Leary has worked his way up through the ranks to his present position, having begun with Chicago Vit in 1927 as storekeeper.

• **Donald O. Notman,** who has been director of the technical division, has become assistant general manager of the electrochemicals department of the E. I. du Pont de Nemours & Co., Wilmington. **Dr. E. A. Harding,** who has been director of production, has been appointed director of the technical division, succeeding Mr. Notman. **Russel L. Hardy,** manager of the Niagara Falls plant, has become director of production, and **Dr. N. C. Jones,** assistant manager of the plant, succeeds Mr. Hardy. **Fred R. Wilson** has been appointed manager of the explosives division of the Du Pont company's explosives department, and **T. R. Carlson** has been named to succeed him as director of production of the division.

• **Albert H. Clem** has been appointed to a newly-created position of field sales supervisor in the special chemicals division of the Pennsylvania Salt Mfg. Co., Philadelphia. Mr. Clem has been with Pennsalt since 1938, when he became Detroit sales representative. **Philip C. Staples, Jr.,** who has been with the company since 1937, succeeds Mr. Clem as product supervisor on cleaners and pickling and descaling products. Succeeding Mr. Staples as product supervisor on corrosion-resistant products is **Robert R. Pierce,** who joined Pennsalt in 1941.

• **David Ross** and **Nat Herman,** vice-presidents, and **Albert B. Dorr,** secretary, have been elected members of the board of directors, Berkeley Industries, Jersey City, N. J.

• **Thomas Nelson** has been appointed director of research and engineering of Machinery Lubricants, Inc., Boston.

• **James C. Bjorkholm** has been appointed advertising manager of the foil division, Reynolds Metals Co. Formerly advertising copy chief of the aluminum division of Reynolds in Louisville, Mr. Bjorkholm will transfer to the foil division headquarters in Richmond, Va. Mr. Bjorkholm has been associated with Reynolds Metals Co. for 3 years.

JAMES C. BJORKHOLM, advertising manager, foil division, Reynolds Metals Co.

• **C. Paul Denckla** has been appointed general sales manager for the Philadelphia office of the Dayton Rogers Mfg. Co., Minneapolis, succeeding the late **E. Graepp. Marvin C. Barnum** has been made New York representative of the company.

• **Alvin Haas** has joined the Hanchett Mfg. Co. of Big Rapids, Mich., as vice-president and general manager. His new affiliation follows a record of 17 years as president and general manager of Yates-American at Beloit, Wis.

• **H. Merrill Bowman,** who has been district sales manager of the Link-Belt Co. office in Baltimore, has been appointed assistant divisional sales manager for power transmission equipment, with headquarters at the company's Pershing Road plant in Chicago. **Eugene S. Bogart** has been appointed district sales manager at Baltimore to succeed Mr. Bowman. Mr. Bogart is being transferred from the Pittsburgh office.

• **Harry Green** and **Carl Senn** have been promoted to consulting positions on the Falk Corp.'s staff, Milwaukee. Mr. Green assumes his duties as consultant on machine shop operations, while Mr. Senn becomes consultant on methods engineering. **B. C. Bugbee,** former production control manager, has been appointed machine shop superintendent.

• **Don S. Bentley** has been appointed factory branch manager of the Los Angeles branch of General Controls Co. He has been with the company for some time as factory sales supervisor. **F. E. Weldon** has been made factory branch manager of the New York office. Mr. Weldon has been with the company in the capacity of AGA representative in Cleveland. **C. G. McCarthy** has been appointed Detroit factory branch manager.

• **Clifton A. Warner,** director of procurement engineering of the research division, Continental Aviation & Engineering Corp., Detroit, has resigned. Mr. Warner's association with Continental covered a period of 7 years.

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• **Raymond J. Bryan** has been appointed manager of the Buffalo stainless steel foundry of the Allegheny Ludlum Steel Corp. He succeeds **Donald M. Scott,** who has resigned to become president of the newly-formed Buffalo Stainless Casting Corp. Mr. Bryan was assistant manager since 1941 and previously was with the Ft. Pitt Steel Castings Co. of McKeesport, Pa.

• **Howard E. Riordon** has been appointed vice-president and treasurer, **Morris B. Chesney,** controller, and **Walter S. Hubbell,** auditor of Colonial Radio Corp., Buffalo.

• **W. A. Roberts** and **W. C. Johnson,** executive vice-presidents of Allis-Chalmers Mfg. Co., Milwaukee, have been appointed to the firm's board of directors.

• **Edwin A. Nickel,** former general sales and promotion manager of Mitchell Mfg. Co., Chicago, has been appointed sales manager of the Kahn Mfg. Co., Milwaukee.

• **William C. Madsen** has been appointed branch manager of the Gary, Ind., office, Reliance Electric & Engineering Co. Mr. Madsen succeeds **H. J. Thompson,** who will become district sales representative in Gary for the electrical manufacturing division, National Acme Co. Mr. Madsen joined Reliance as an application engineer in 1941 and except for a year's war service in the U. S. Naval Reserve, has been with the company ever since.

• **Dr. Fred E. Kendall** has been appointed director of research of the Master Builders Co., Cleveland. For 5 years prior to joining the research staff of the Master Builders Co., Dr. Kendall was chief of research chemistry of the Republic Steel Corp.

• **George R. Sommers,** formerly Pacific Coast manager of lighting products for Sylvania Electric Products, Inc., has been appointed director of sales for all product divisions of the company in that area with headquarters in San Francisco.

WILBUR DEUTSCH, general sales manager, Trabon Engineering Corp.

• **Wilbur Deutsch** has been appointed general sales manager of Trabon Engineering Corp., Cleveland. Since joining the Trabon organization in 1936, he has served the company 4 years as sales engineer and erection superintendent and for 5 years was associated with F. R. Magill in Pittsburgh. During the past 2 years he has been in charge of sales and service for Trabon on the West Coast.

• **Guy P. Bible,** general manager of Horace T. Potts Co., Philadelphia, has retired after 36 years' service with the company. He has been succeeded by **Claude Mengel,** former office manager and purchasing agent for the firm, with which he has been associated since 1920, and as a partner since 1938. Mr. Bible became a partner in the firm in 1920 and will retain his partnership. **Allan W. Ainsworth** and **Thomas I. Potts,** also partners, have been named manager of the steel division and purchasing agent, respectively. **Curtis R. Spencer,** with the company since 1929, has been made office manager.

• **William C. Marsh,** who founded the Marsh Valve Co. of Dunkirk, N. Y., in 1910, has retired as vice-president and manager of the firm. His assistant, **James G. Devin,** succeeds him in both positions.

• **J. Harry Marshall,** assistant secretary since 1938, assistant general manager since 1942 and a director since 1943, has been elected a vice-president of the Nicholson File Co., Providence, to succeed the late Augustus E. Saunders. **Paul C. Nicholson, Jr.,** has been made secretary and **Robert W. Marshall,** assistant secretary. **E. Blair Le Fevre,** mechanical engineer since November, has been made a director.

• **Paul J. Keller** has been named assistant to the vice-president in charge of manufacturing at Rinshed-Mason Co., Detroit.

• **Hugh J. Hales** has been appointed service manager, and **Eugene Foley,** organization and analysis manager of Pontiac Motor Div., General Motors Corp., Pontiac, Mich. Messrs. Hales and Foley succeed **Earl Taber** and **Earl Gouldman,** who have resigned to become partners in a Pontiac dealership at Atlanta. Mr. Hales joined Pontiac in 1932. In 1938 he went to Cleveland as service manager and was service manager at Chicago when called to Pontiac last May as assistant general service manager. Mr. Foley joined Pontiac in 1940. Before entering the Army in 1941 he had become office manager and district manager. In 1946 he returned to Pontiac as sales and service district manager at Cleveland and last February was called to Pontiac as assistant to Mr. Gouldman, whom he now succeeds.

• **Dr. Haig Solakian,** for 12 years vice-president, chief metallurgist and director of research for the A. F. Holden Co., has resigned to accept the position of president of the John Ek Industries, Inc., Guilford, Conn.

• **Alan P. Schreiber** has been appointed to the sales staff of Tracerlab, Inc., Boston. He will also act as editor of *Tracerlog,* the monthly technical publication of Tracerlab, Inc. Mr. Schreiber was previously associated with the Manhattan Project at Oak Ridge as technical adviser on patent matters and prior to that he worked with the chemical bureau, War Production Board, in Washington.

• **M. H. Blesh** has been named manager of manufacturing in the control divisions of General Electric Co.'s apparatus department, Schenectady. **C. B. Bradish** has been named manager of engineering, and **E. A. Green,** manager of sales. **Thomas I. Hage** has been appointed accountant for the divisions. Mr. Blesh joined GE in 1928. He was appointed superintendent of the control division in 1944. Mr. Bradish, who joined the company in 1912, became assistant designing engineer of the division in 1924. Mr. Green has been assistant to the manager of the industrial divisions, and Mr. Hage has been assistant to the works accountant.

• **Robert Heller,** head of Robert Heller & Associates, has been elected a director and member of the executive committee of Jack & Heintz Precision Industries, Inc., Cleveland.

• **Stephen A. Harrington** has been appointed branch manager of the Cleveland office of TelAutograph Corp., New York. For the past 4 years Mr. Harrington was with Diebold, Inc.

• **T. S. Petersen** has been appointed president of Standard Oil Co. of California, San Francisco, to replace **R. G. Follis,** who had been president since 1945 and is now advanced to the newly-created position of vice-chairman of the board.

CLIFTON W. BRANNON, secretary and general counsel, R. G. LeTourneau, Inc.

• **Clifton W. Brannon** has been elected secretary and general counsel for R. G. LeTourneau, Inc., Longview, Tex. He succeeds **Frederick V. Arber,** who has resigned. Mr. Brannon has been affiliated with the LeTourneau industry for the past 8 years as head of the legal department for the Toccoa, Ga., and Longview plants.

• **Ossie H. Bowden,** formerly farm products agent for Alabama for the Tennessee Coal, Iron & Railroad Co., Birmingham, has been promoted to farm products marketing agent.

• **G. E. Tenney** has been made service manager of the Lincoln Electric Co., Cleveland. He had been district manager for the Lincoln Chicago office for 15 years.

• **Walker L. Cisler, James H. Lobban** and **Edward T. Gushee** have been elected vice-presidents of the Detroit Edison Co., Detroit. **Thomas E. Hurns** has been appointed general accountant.

• **Jonathan C. Gibson** has been named vice-president and general counsel of the Santa Fe Ry., Chicago, succeeding **E. E. McInnis,** retired. Mr. Gibson, who was formerly general solicitor for the Santa Fe, has been succeeded by **R. S. Outlaw,** formerly general attorney for the railway.

• **Robert H. Harris** has been appointed assistant general manager and **Carl E. Dreher** appointed sales manager of the Westinghouse Electric International Co., Pittsburgh. Mr. Harris, who has been sales manager of the company since 1946, replaces Douglas C. Lynch in the assistant general manager's post. Mr. Dreher, the new sales manager, was manager of the western hemisphere department.

• **F. H. Knickerbocker,** executive assistant to the president of the Union Pacific R.R., Omaha, Neb., has retired.

...OBITUARY...

• **Percy T. Oldham,** 58, manager, marine division for Lukens Steel Co. and its divisions, By-Products Steel Co. and Lukenweld, Coatesville, Pa., died Jan. 18.

• **Milton H. Frommann,** 49, general superintendent of the Townsend Co., New Brighton, Pa., died recently.

• **James Coulter,** retired president and treasurer of the James Coulter Machine Co., Bridgeport, Conn., died Jan. 2.

• **Walter G. Zimmermann,** 71, retired senior contracting manager of American Bridge Co., Pittsburgh, died Jan. 13.

• **P. J. Greco,** founder and president of P. J. Greco & Sons, Tarentum, Pa., died Dec. 18.

• **A. Emory Wishon,** 65, executive vice-president of the Pacific Gas & Electric Co. in San Francisco, died Jan. 4. He had been associated with the PG&E and its predecessor companies for 38 years and during the war was vice-president and general manager.

• **Robert W. Hannan,** president of Pittsburgh Tube Co., Pittsburgh, died Jan. 11.

• **Paul W. Cotton,** 67, who retired in 1946 as vice-president of Bethlehem Pacific Coast Steel Corp., San Francisco, died Jan. 13.

• **William C. Collins,** 56, vice-president of the Bethlehem Steel Co. shipbuilding division, died suddenly Jan. 15. Mr. Collins was formerly general manager of the Boston district and in 1946 was transferred to New York.

• **Peter M. Schlax,** 70, for many years plant superintendent and a director of the Specialty Brass Co., Kenosha, Wis., died Jan. 4.

• **John M. Detling,** 67, chairman of the board of the Vollrath Co., Sheboygan, Wis., died Jan. 8.

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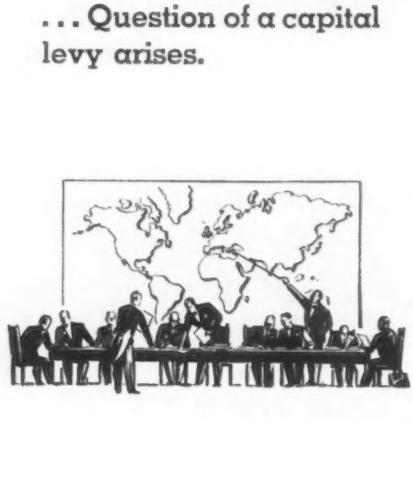
European Letter . . .

• Long suppressed existence of inflation in Britain beginning to come out . . . Argument for disinflation concentrates on wage incomes . . . Question of a capital levy arises.



LONDON — Slowly, very slowly, public opinion is coming round to the view that one of the things that is wrong with the British economy — and almost the only thing that is within the control of the British government —is the inflationary pressure that is distorting it. Several things are contributing to this gradual conversion. For one thing, it is obviously true that inflation is the great problem everywhere else in the world.

In Russia, in America, in France, steps of varying effectiveness are being taken against it and the task of believing that Britain alone is exempt from this worldwide plague is proving to be beyond the powers of even the most obtuse complacency. Moreover, the inflation in Britain, so long suppressed, is beginning to come out. The prices that have to be paid for food, whether to the British farmer or to the overseas producer, are rocketing up.

The price of coal has just been raised to more than double the prewar level, and still the Coal Board runs at a loss. Transport wages are going up, and the surplus with which the Transport Commission hoped to start looks like turning into a deficit. There is hardly a price in the list that is not being pushed up. Not merely is there an obvious inflation, but it is also clearly reaching the rampant stage.

HITHERTO, the argument for disinflation has been mainly concentrated on the flow of incomes arising from wages. This primary attention can be justified, because wage-incomes are not only the overwhelmingly largest part of all private incomes but also the only category which is substantially greater now, in real terms, than it was before the war. Clearly, if there is to be a disinflationary effort it must concern itself with wage incomes much more than with any other forms of income. But it is not right that other incomes should be excluded from its purview; and even if it were right, it would not be politically possible, especially with a labor government in office.

It is very difficult, however, for even the most determined defender of the working class to make out a convincing argument to the effect that other classes of income as a whole are bloated. The statistics are all against him. The real net value of the average salary is clearly down; so, even more obviously, is the real net value of incomes derived from rents or fixed interest. Even profits, in spite of the unsupported assertions to the contrary, are almost certainly lower, in real purchasing power after taxation, than they were before the war.

The argument is therefore concentrated on spending out of capital. Some of this there undoubtedly is, and much of what there is makes a conspicuous splash in austerity conditions. There is also, unquestionably, a certain amount of spending out of expense accounts, which is also very visible in the West End of London.

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It is doubtful whether the sum total of all these kinds of sumptuary expenditure amounts to very much; but it exists, and it cannot be ignored. It is perhaps to be taken as a good sign that Labor MPs are beginning to think about ways in which this flow of excess demand from "the rich" could be stopped, since it shows that their minds are moving in a disinflationary direction. In general, the argument can be conceded.

In a rounded policy of disinflation, which covered a sharp reduction in government expenditure (including, inevitably, a curtailment of subsidies), a smaller reduction in taxes and therefore an increase in the surplus, and a check to the rise in wages — in such a rounded policy, measures to reduce other forms of unnecessary spending should certainly find a place. So far the argument is easy; the problem is, what measures?

THE favorite weapon of the Left is a capital levy. It appeals to all their instincts; and it has, indeed, a respectable lineage of support outside the circles of the Left, narrowly so-called. But for achieving the purposes that are now needed, it is a very blunt instrument indeed. It is not fashionable to inquire whether a levy on capital, which has suffered from the war and its attendant circumstances, while wage incomes have gained, would be just. There might be some justification for a levy on all those holdings of capital that have increased since 1939—certainly on those that have increased by more than the rise in the general price level. But there is no way of identifying them now, since there is no record of capital holdings before the war.

The only practicable form of capital levy would be one that penalized all capital, whether it has risen or fallen, whether or not it is being drawn upon to sustain an excessive flow of spending. Any such project, apart from its questionable justice, would give rise to endless anomalies. If there were no exemption limit, administration would be difficult; and if there were a limit, the levy would lose still more of its justification and of its efficacy.

How would it be proposed to treat the hundreds of thousands of persons whose entire capital is locked up in the houses they live in? Would they be compelled to seek additional mortgages, at a time when mortgagees were also compelled to seek ready cash? And what about people whose whole capital is actively employed in their

business? These difficulties are not perhaps insuperable, and the effort to overcome them would be worth while if the capital levy were likely to be supremely effective. But is it?

IT HAS long been recognized that in these days of heavy progressive taxation, a capital levy, the proceeds of which were used to redeem debt, would bring only negligible benefits on balance to the budget owing to the loss of income tax revenue that it would involve. But if the net benefit to the state's income is small, surely it follows that the net loss to private incomes would also be small? And as for the capital levy's effect on spending out of capital, is it not as likely to be bad as good? Is not the average capitalist likely to conclude that he had better make haste to spend his capital before the levy is repeated? And whether or not this is so, it is virtually certain that a capital levy would discourage savings.

Another possible device would be a blocking operation, such as that by which Mr. Gutt won fame in Belgium. This is theoretically much more attractive than a capital levy. It applies only to those forms of capital that are likely to give rise to excessive spending—that is, to the more liquid forms. Moreover, it is not a permanent confiscation so much as a temporary forced loan, and the unblocking might at a later stage serve as useful a purpose of economic policy as the blocking would now.

But a blocking operation is nevertheless a very difficult matter to carry through, and likely to be particularly difficult in Great Britain, where banking and credit trading are both much more developed than in continental countries. It would give rise to many of the anomalies of a capital levy, and to a host of hard cases which could neither be ignored nor be dealt with except at the cost of a formidable administrative apparatus. It would not be impossible to carry out, and it would be likely to be fairly effective for its purpose. But it should certainly not be lightly embarked upon.

MUST it therefore be concluded that there is no comparatively simple and certainly effective method by which capital can play its part in a disinflationary policy? That would be a most unfortunate conclusion. There is unfortunately little enough likelihood of a Labor government taking the need for disinflation seriously, and the prospect would disappear completely if capital had to be left out of the program.

It happens that there is a method, which is likely to be effective, which requires no administrative apparatus, which will encourage thrift and discourage capital expenditure, which will lower the market value of all forms of capital and therefore discourage realizations of capital to finance current expenditure, which will equally discourage all forms of extension of credit for trading purposes. This is, of course, the old-fashioned remedy of a sharp temporary rise in interest rates. But unfortunately, as everybody knows, higher rates of interest are a reactionary device of baleful Bourbons.

By a strange twist of logic, the classical device for whipping capital into line has come to be regarded as a concession to the very capitalists who would be constrained by it. But if the Chancellor of the Exchequer wishes to make sure that capital plays its part in a disinflationary policy, this is obviously the way to do it.

Columbian Carbon Co. Buys Government Plant

Washington

• • • **A government-owned** carbon black plant in Seagraves, Texas, built to produce channel black for the wartime rubber program, has been sold to the Columbia Carbon Co. for $1,420,000.

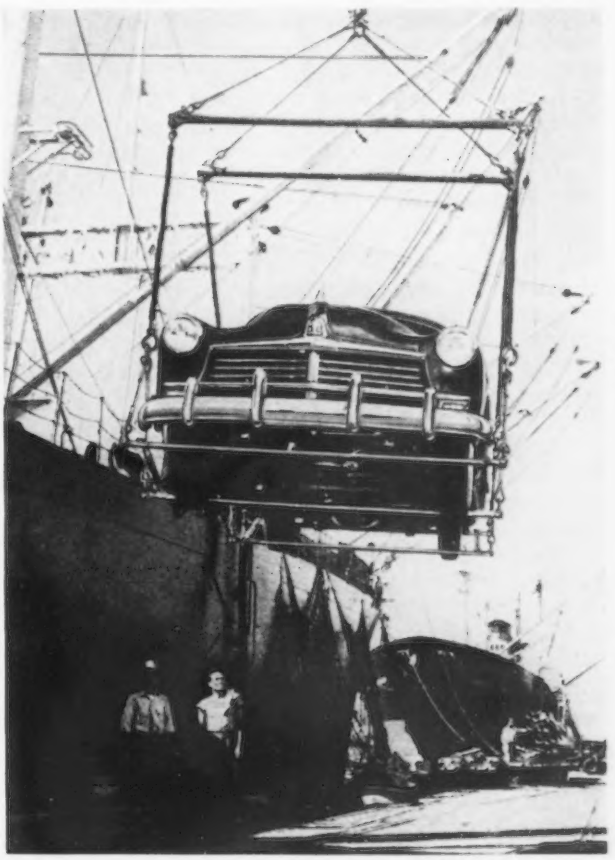
The plant, which has been under lease to Columbian Carbon Co., is one of the most completely equipped of the carbon black projects fostered by the government. It cost $2,226,179 and has an appraised fair value of $1,779,679.

The gas supply line is 12½ miles of 20-in. pipe, conveying gas from a treater plant to the carbon black plant. A railroad spur runs 3 miles from Seagraves to the plant and includes 1000 ft of switch track at the site.

o o o

HOLD EVERYTHING: *These Hawaiian dock workers appear to be equally interested in having their picture taken and watching the unloading of the first new Hudson delivered to the Hawaiian Islands. During the first showing of the car in Honolulu 5000 people are said to have crowded into the showroom.*

o o o



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Industrial News Summary...

- **Scrap Is No. 1 Nightmare**
- **Steel Quotas Slashed Again**
- **Ingot Rate Drops to 95 Pct**

THE No. 1 nightmare for steel consumers this year will be sharing the steel scarcity through government-sponsored voluntary allocation programs. But the No. 1 bogeyman in the steel industry, which is scaring the daylights out of some steel producers, is the short supply of open market scrap. Unless enough additional scrap is obtained this year to utilize the increased steel capacity recorded as of the first of the year, there is little chance of a change in the tight steel situation.

Steel users have been fortunate in that steel firms have won their third battle in preventing a runaway scrap market. Had this not been the case, prices would have skyrocketed to such an extent that steel firms would have been forced to raise prices on the basis of scrap costs alone. For the time being, it appears that a shaky lid has been placed over the boiling scrap price pot. This does not mean, however, that steel production officials will find it any easier to obtain the increased scrap supplies necessary to utilize additional capacity.

Fantastic is the word for the steps steel mills are now being forced to take to assure supply of steelmaking scrap. Market scrap—that not earmarked at steel consumers' plants to be returned to the producers—is more difficult to obtain today in large amounts than at any time in history. Large sales are no longer the rule. Practically all scrap consumers are buying small tonnages on the open market in addition to the rough policy of demanding that their steel customers return scrap, resulting from manufacturing operations, to their openhearths.

This practice of earmarking scrap for return to the mill has been increasing. One large producer, who some months ago merely asked for cooperation in returning scrap, has now put it on a business-like basis—no scrap, no steel. Another smaller producer has been forced to take this action within the past few weeks.

GRADING, or the buying and selling of scrap according to accepted specifications, has gone by the board. As supply has diminished, scrap buyers have become less particular about grading. When a few buyers let down the bars, all had to follow or get nothing. No. 1 heavy melting steel invariably finds its way into consumption under a different name and at a higher price.

In the past when scrap was scarce those with a sense of humor left have said, "If it doesn't blow away, it's heavy melting steel." Something new has been added, "Even if it does blow away, it's still heavy melting steel." This is not far from the truth in the present day scrap market.

Scrap consumers at Pittsburgh and Chicago have been able to keep the market steady this week with no changes in the price of heavy melting steel. In the erratic Philadelphia market, No. 1 heavy melting this week has dropped an average of $3 a ton. THE IRON AGE scrap composite price is down $1 this week to $40.83 a gross ton.

With older capacity, along with some new capacity, having been added to the 1948 official steel capacity figure, the industry is bound to operate at a lower percentage until more scrap, more pig iron and a better grade of coke become available. Strong efforts are being made to increase the amount of hot metal in the openhearth, along with renewed activity in an attempt to pressure the Government into making available more wartime scrap. This week steel ingot output is down 1 point to 95 pct of newly-rated capacity. From a tonnage standpoint this rate still reflects peacetime peak levels.

CONSUMERS of structural steel, plates, rails, bars and wire products from the Pittsburgh and nearby districts are facing a hold-up of deliveries because of the gas shortage in that area. Cold weather in the past 2 weeks caused more than a dozen finishing lines to be shut down. Some steel fabricators found their shipments completely shut off as gas companies tried to stretch gas supply for home heating. Promised shipments will eventually reach steel customers but there will be a delay by as much as 2 weeks.

Steel consumers this week were deluging sales offices attempting to obtain information on steel allocations. Little information was available because the program will not be in shape for several weeks yet, if then. Aggravating this frame of mind is the cold fact that most steel customers will find their second quarter quotas slashed. For the next several months at least, there is no possible chance of any change in the current tight steel situation.

Two major producers have eliminated the arbitrary delivered price for alloy steels in the Detroit and eastern Michigan areas. This means that these companies will not absorb freight from the point of production to the Detroit area. Another major steelmaker recently took the same action on steel sheets and strip. Automobile manufacturers who are not steel producers, when buying from the companies which took the basing point action, will pay the freight from the closest basing point to the Detroit area.

Prospects for steel expansion in overseas countries helping the world steel shortage this year are slim. There are many expansion plans, but few of them will be effective before 1950. In many countries it will be at least 2 years after that before new capacity will come into operation.

• **GRAY MARKET**—Total gray market premium payments of $330,000 for the single month of December were paid by one farm equipment manufacturer for steel shipped to a single manufacturing plant. This same firm has set up $3 million in its production budget for 1948 for premium and bonus payments in connection with steel expediting. This firm is paying from $160 to $175 a ton for super quota sheets and has shipped odd lots of steel from the West Coast, paying $2000 per car freight charge in addition to premiums and bonuses to the odd lot sources it has developed.

• **PARADOX**—After averaging almost 29 of its 30 openhearths in daily production during December and producing 290,000 tons of steel ingots (a new record), the Lackawanna works of the Bethlehem Steel Co. this week sank to an operating low of only 24 furnaces. Scrap shortage was blamed. After refusing to purchase scrap in recent weeks for amounts in excess of prevailing price, the company won another round in its scrap battle when it purchased about 7000 tons of No. 2 scrap for $39.75 a ton.

• **REQUIREMENTS**—Congressional sources backing the St. Lawrence Seaway Project estimate that material requirements will consist, among others, of 100,000 tons of reinforcing steel and rails, and 100,000 tons of structural and miscellaneous steel for the United States and Canada combined. Other requirements listed include 700,000 tons of cement and 84 million fbm of lumber.

• **OIC CONSULTANTS**—Three prominent steel executives have agreed to serve as consultants to the Office of Industry Cooperation, according to the Dept. of Commerce. They are: David Austin, vice-president, U. S. Steel Corp.; Walter Watson, vice-president, Youngstown Sheet & Tube Co.; and J. K. Beeson, executive vice-president, Pittsburgh Steel Co. They will serve on a noncompensatory basis and will be subject to call by the OIC for consultation on technical questions arising in connection with the problems of steel allocations and distribution.

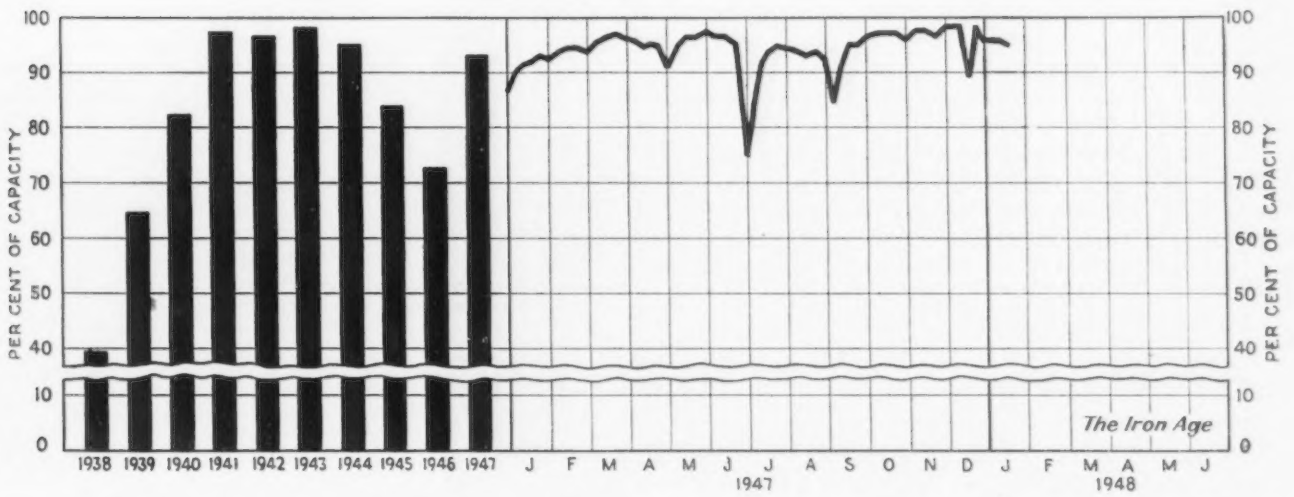
• **U. S. STEEL EARNINGS**—U. S. Steel's 1947 earnings were $126,704,272 compared with $88,622,475 for the year 1946. Earnings in the fourth quarter of 1947 were $29,397,811 compared with $28,735,082 in the third quarter of that year and $31,215,636 in the fourth quarter 1946. Earnings per share 1947 were $11.66 compared with $7.29 in 1946. Earnings per share in the fourth quarter 1947 were $2.65 compared with $2.58 in the third quarter of 1947 and $2.86 in the fourth quarter 1946. Shipments in 1947 were 20,300,430 net tons compared to 15,181,719 net tons in 1946. Shipments in the fourth quarter 1947 were 5,359,763 net tons compared with 4,808,277 net tons in the third quarter of 1947 and 4,902,742 net tons in the fourth quarter 1946. Fourth quarter ingot operations were 100.7 pct. For the year 1947 they were 96.7 pct. For the year 1946 they were 72.9 pct.

• **ROLLING RECORDS**—U. S. Steel rolling units chalked up two all-time steelmaking records in 1947 at McDonald works of Carnegie-Illinois near Youngstown. The 43-in. continuous strip mill topped its best previous annual record by turning out 732,445 tons of steel coils. The old record of 688,249 tons was set in 1944. Another record-breaker was the 12-in. strip mill with 104,190 tons of narrow strip steel. This topped the former high of 102,581 tons, also established in 1944.

• **EXPENSIVE SCRAP**—A Chicago purchaser of gray market sheet recently paid $320 a ton for a car of 20 gage temper passed and oiled stock. The entire shipment was found to contain blister defects and had to be scrapped. The purchaser has no recourse of complaint, as such tonnages are not replaced when found to be defective.

• **EXPORTS DOWN**—Foreign trade during November dropped $146.8 million, according to latest Census Bureau statistics. Despite increased food exports, export totals decreased $91.2 million and imports fell off $55.6 million. Iron and steel semimanufactures dropped from $38.1 million to $37.5 million, while aluminum shipments increased $300,000 to $3.1 million. Finished iron and steel shipments decreased from $23.9 million to $21.2 million. Little change was noted in industrial machinery exports which stood at $115 million.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
January 20	97.0*	93.0*	93.0	93.5	93.0	101.5	100.0	102.0	102.5*	98.0	110.0	89.5	102.0	96.0
January 27	97.0	92.5	93.0	93.5	96.0	93.0	99.5	103.0	101.0	95.5	107.0	80.0	87.0	95.0

* Revised.

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BOURDON TUBE WORKING PRINCIPLE

CHARLES T. FLACHBARTH

Chief Engineer—Precision Tube Company

Bourdon Tubing functions in an interesting manner which, to our knowledge, has never been expressed in mathematical relationships that completely predict its behavior under pressure or vacuum. This does not mean that Bourdon gauges are inconsistent—indeed they are highly reliable when used within the pressure ranges they are built for. The absence of a complete analysis merely means that each new design must be thoroughly tested, and cannot be developed by calculations alone.

Persons newly confronted with Bourdon problems often do not understand why a curved tube tends to straighten out when pressure is applied. The pressure exerts a definite force, expressed in pounds per square inch. If the curved tube follows an arc of a circle, the inside path along one side of the tube is longer than a similar path diametrically opposite. Since one inner path is longer because of the curvature, that portion of the tube represents a greater area. The pressure, which is everywhere the same, contributes a greater force to the direction of greater area, which is along the side that follows the longer path. This force is in the direction to straighten the tube. Similarly, a vacuum tends to force the tube into a smaller arc. This much is simple to calculate for a known shape of Bourdon tubing formed in a definite way.

The difficulty arises in attempting to predict what the effect of this force will be on a curved tube, with suitable end corrections. This requires a knowledge of the stiffness of the tube. Here the tubing manufacturer assumes a role of paramount importance. His responsibility is to furnish seamless tubing with constant wall thickness, consistent spring properties, and exact duplication when considered as a structural beam. In general, the materials which have the required high proportional limit are not the ones which are worked most readily. This has proved to be a realm which genuinely requires the fine finish, close tolerances, production control, and metallurgical "know-how" of the Precision Tube Company.

INSTRUMENT POINTER TUBING KITS NOW AVAILABLE

For some time, laboratories and instrument repair men have been faced with difficulty in obtaining small quantities of accurately drawn aluminum alloy pointer tubing made to the exacting metallurgical requirements of this application.

To meet this demand, the Precision Tube Company has introduced a kit which consists of 25 feet of any combination of the following sizes:

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.026" O. D. × .0015" Wall
.023" O. D. × .0015" Wall
.0155" O. D. × .0015" Wall
.023" O. D. × .002" Wall
.019" O. D. × .002" Wall
.0155" O. D. × .002" Wall

52-S ALLOY

.019" O. D. × .0015" Wall

The purchaser specifies whether he wishes all one size, or any combination of sizes, in convenient lengths to total 25 feet. Price of the kit is five dollars, which includes postage to any place in the United States.

One of the problems of instrument repairing has always been to match the inertia and mass of the original system. Availability of a stock of various pointer sizes from Precision at last makes this possible.

(Advertisement)

Confusion Rules the Scrap Market as Old Doctrines Disappear

Earmarked Shipments, Gray Market and Conversion, Demand Are Blamed

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

Pittsburgh

• • • **Confusion** is the word for the current iron and steel scrap market. Reports from the trade's Chicago convention indicate that many of the old doctrines have gone by the board without any new ones to replace them. Gone are the days when brokers took big, long or short positions; when they acted as traffic men to route material most economically. Specifications have become meaningless. The consensus was that four factors are responsible: (1) Earmarked shipments; (2) conversion arrangements; (3) gray market trading deals; and last and most important, unprecedented demand.

Earmarking of scrap has increased lately. Only recently a moderate sized steel producer that never put any pressure on its customers to return scrap found it necessary to do so. Just a month before that one of the big mills finally had to put the scrap return arrangement on an official basis. It is becoming clear that any mill that doesn't do so stands a good chance of being left out in the cold. Nor is this earmarking a haphazard arrangement, relying entirely on good fellowship and moral suasion. Steel companies with experience in this line keep records of every ton of scrap shipped back to them by every customer.

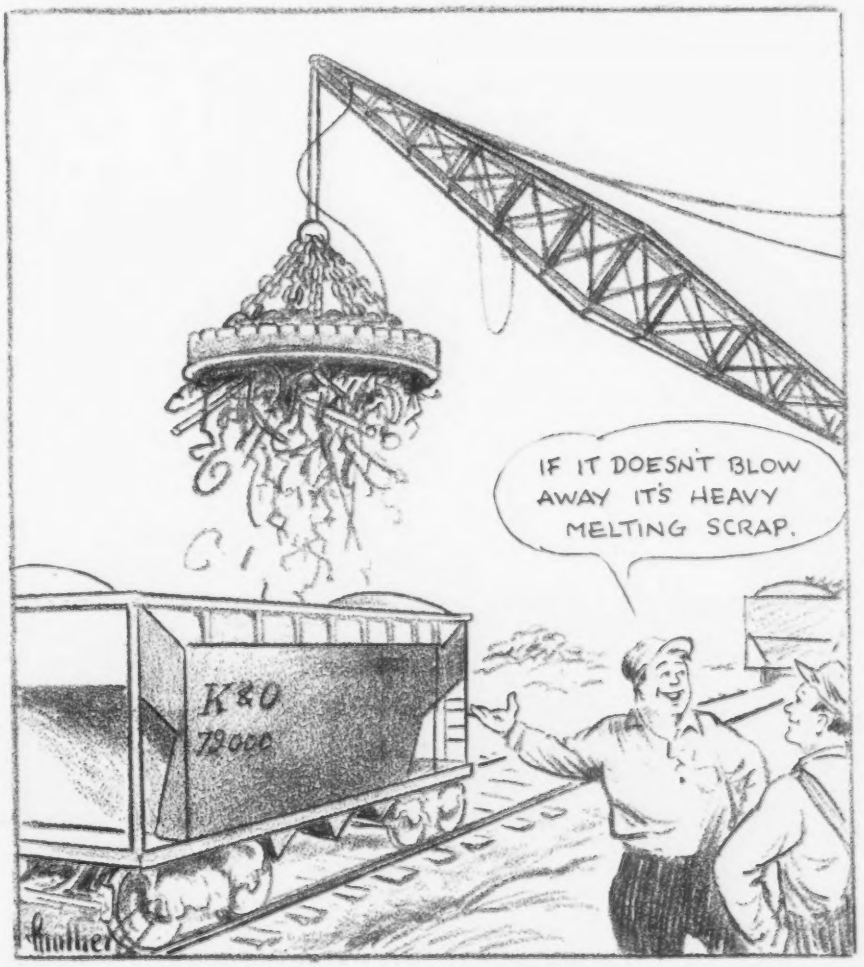
From these records the sales departments are instructed to work. Where there's any question the scrap buyer is called: "What's this fellow's record on returning scrap?" The steel company knows his operations and has figured what percentage of scrap he should be shipping back to the mill each month. If the consumer falls down an explanation is called for. This, incidentally, is a fine check on possible gray market sales of excess steel. But it checks only some classes of consumers — those with manufacturing operations that normally generate scrap. The customer's location or furnaces of his own may also rule out any scrap return to the original mill.

The economics of earmarking scrap have long been debated. One theory is that withdrawing this substantial tonnage from the market so restricts what is left for open, or free market trading, that it forces up the price of the latter. For this theory the purchasing agent of a large steel company has only scorn. "If we turned all the earmarked scrap loose on the market we would simply be giving these birds that much more to speculate with," he snorted.

But with free market scrap so limited, no trade authority will deny that scrap buying for ingot conversion deals has run up the price of free market material. If there were more free market scrap to bid upon, the price wouldn't be forced as high, according to the old economic law of supply and demand. This, says the steel mill materials man, may be sound in principle but in today's scrap market it's dog eat dog and the devil take the hindmost.

To make the laws of economics look more ridiculous—a lot of earmarked scrap moves on the open market price basis, under contracts. The theoretical economist

Even If It Does, It Is



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can only gasp at the spectacle of a limited amount of free market scrap setting the price for a lot of earmarked material returned by customers.

Some of these contracts recognize that No. 1 heavy melting steel is a fiction. It is a fiction that is being maintained for lack of anything else. But very little steel scrap bought in the free market as openhearth steel meets the specifications for No. 1 heavy melting steel. Recognizing this, one large fabricator has a contract with a scrap broker based on the going quotations for openhearth steel to which is added a flat 12½ pct. This is because this fabricator's scrap is like the old No. 1 heavy melting steel. In the old days when scrap quality *exceeded* No. 1 steel specifications it was called high grade industrial scrap. Today anything that *meets* No. 1 steel specifications is called high grade industrial scrap or low phos.

Anything better is called genuine low phos. Low phos has been broken down into several unofficial divisions such as 5-ft low phos. This can be bought for several dollars less than low phos cut to 3-ft lengths and otherwise meeting specifications. Specifications are those of OPA, still used because so well drawn, or of the Dept. of Commerce.

To further complicate things, railroads allocate most of their No. 1 heavy melting steel to mills at $1 over the openhearth "formula" price. They sell other No. 1 material at higher prices to foundries, as in the past. But the spread on this grade is now as much as $7 or $8 a ton between prices to mills and prices to steel foundries. Railroad specialties such as coil and leaf springs, rolled steel wheels, knuckles and couplers were priced at $3.50 over the R.R. No. 1 heavy melting price. These days it is not unusual to see them sold for $12 to $13 over the No. 1 price.

The same disregard of specifications by buyers and sellers applies to cast iron grades. The term No. 1 cupola cast has been considerably broadened. Like steelmaking scrap, demand has made it difficult to hew close to specifications. And like the steel mills, all the foundries can hope for these days is careful segregation. They realize, as R. L. Collier, executive vice-president, Gray Iron Founders Society, put it at Chicago, that there is a ready market for any kind of scrap that doesn't float in water.

There are a few who believe this situation could be cleared up but they are in the minority. Most trade sources — buyers, brokers, sellers — agree that these conditions, like the gray market, are a product of the times; no particular group is alone responsible. And they add, it will get worse before it gets better.

Commerce Spokesman Warns Scrap Dealers On Trade Practices

Chicago

• • • **Scrap officials were** warned by Walter Janssen of the Commerce Dept. that existing trade tractices might lead to compulsory government controls on the industry by the end of this year. He listed "conversion deals, earmarking, bid up markets, tie-in sales, and intensified direct dealing" as the offending faults of the trade. He spoke at the annual convention of the Institute of Scrap Iron and Steel held here last week.

New officers for the Institute for the next year included Herman D. Moskowitz, Schiavone-Bonomo Corp., Jersey City, president; Edward L. Solomon, Max Solomon Co., Pittsburgh, first vice-president; Marshall A. Shapiro, California Metals Co., Oakland, Calif., second vice-president; Stanley M. Kaplan, M. S. Kaplan Co., Chicago, secretary; Samuel G. Keywell, Samuel G. Keywell Co., Detroit, treasurer.

Edwin C. Barringer, who has previously served as the executive secretary of the Institute, has been elevated to the newly created post of executive vice-president.

Mr. Janssen spoke for the government at a symposium held on the first day of the convention, along with L. D. Greene, consultant to the American Iron & Steel Institute, and R. L. Collier, executive vice-president of the Gray Iron Founders' Society, Inc.

The Commerce Dept. spokesmen reminded the members of the Institute gently that no one involved wants to see the trade return to the conditions of a "police state." He pointed out that the practices to which he referred were clearly in violation of the ethical precepts of their trade organization.

He also suggested that the industry might wish to evolve with the government a system for participation in the system of voluntary controls of industry authorized recently by Congress, "as a safeguard against the inflationary tendencies which are reflected in the current runaway markets and thereby set the pattern for scrap allocations, and aid in the establishment of a set of fair trade practices, and related values for scrap of various grades."

Mr. Greene expressed confidence that the increased demand for scrap this year by the steel industry will be met. He indicated that he already sees signs of the resumption of prewar scrapping cycles. He also called Germany a gold mine of scrap, and stated that he felt that a lot of good material would come out of the former war areas in the Pacific.

Outlining a program for the Institute for the coming year, Mr. Barringer stated that the government seems to look favorably on the pooling of the resources of the scrap firms in large overseas gathering ventures. He mentioned the advisability of study on the question of shifting to the net ton for the standard weight unit in the trade, called for certain amendments to the Surplus Property Act, and mentioned the possibility of a series of meetings to bring the 15-year-old Dept. of Commerce scrap specifications up to date.

Scrap Four Battleships

London

• • • **Scrapping of** the four battleships, Queen Elizabeth, Valiant, Nelson and Rodney, and the battle cruiser Renown, will provide the British steel industry with some 82,000 tons of metal. A half dozen cruisers and some smaller vessels which are also to be disposed of, may be purchased by allied countries, but the battleships are to be broken up for scrap.

Drive to Release Government Scrap Gains Momentum in Congress

Outlook Good for Wherry Bill Designed to Free About 6 Million Tons

By GEORGE H. BAKER
Washington Bureau

Washington

• • • **Congress,** finally convinced that the best remaining sources of scrap lie within the continental United States, this week took up new legislation designed to release an estimated 6 million tons from government stocks.

Despite all the talk of retrieving battle scrap from the Pacific and from Europe, the actual returns from these areas have amounted only to a few drops in the bucket. It has been clear for some time that the best immediate sources are within the U. S.

Senator Wherry, R., Neb., chairman of the Senate Small Business Committee, is sponsoring a new bill which would require the Army, Navy, War Assets Administration and Maritime Commission to cough up surplus machinery and ammunition for industry's scrap piles. Much of these stocks, now in government warehouses, consist of obsolete material.

Estimates as to how much scrap is available from these government sources range from 5 million tons to 25 million tons. One government source says unofficially that a maximum of about 12 million tons might thus be made available. Industry's scrap experts, however, retort coldly that any estimate in excess of 6 million tons is "just wishful thinking."

About the only point of agreement among Washington scrap experts—both in the government and in industry—is that Army, Navy, Maritime Commission and WAA are hoarding a lot of obsolete material that could best be utilized in a furnace. "One million tons of scrap in the next 90 days would be worth 5 million tons 2 years hence," is the way one industry man puts it. The same spokesman predicts that release of these government stocks of potential scrap would be the greatest single contribution toward elimination of gray markets.

A close look at the government agencies now sitting on these potential scrap piles shapes up this way:

Navy hasn't got much left to offer. Its disposal of surplus vessels are about completed.

Army, however, is a much better source. Domestically, there are about 18 million tons of shells which are either obsolete or due for discarding because of advances in ammunition standardization. In Europe, despite continuing British and Russian efforts to drain off the most readily available scrap, a maximum total of about 425,000 tons of Army-generated scrap should find its way back to the U. S. this year.

Maritime Commission still has about 1500 liberty ships for which there aren't any takers by shippers. Scrapping of this fleet should turn up several million tons, according to ferrets for the trade.

WAA is probably the biggest single source, but the agency continues to profess ignorance as to its inventories. Scrap consumers believe it should be possible to shake loose between 3 million and 4 million tons of potential scrap from WAA.

WAA says it can't schedule scrap sales until JANMAT has finished looking over stocks of surplus machine tools. The agency also complains it's between the devil and the deep in this respect: If it unloads all its surplus machine tools for scrap and an emergency comes it is faced with Congressional investigation and probably prosecution. If an emergency doesn't come in the near future, it is faced with Capitol Hill probes and prosecution for holding badly needed material off the industrial markets. What the agency doesn't admit is its excess of petty officials who are in no hurry to liquidate themselves out of jobs.

Outlook for the passage of the Wherry Bill, therefore, is extremely good. There may be some opposition from agencies like WAA, but the pressure from industry, exerted through the Senate Small Business Committee, is strong enough to lick any obstacles of this type. Bureaucracy has always operated without a self-starter. Bumper-to-bumper nudging is slow and costly, but it's the only foolproof means of getting the juggernaut into action.

BOUND FOR BRAZIL: *Destined for service on the Central Railways of Brazil, these cabs, trucks and controls at the East Pittsburgh works of Westinghouse will shortly be assembled into finished locomotives. When finished, each will weigh* 165 *metric tons and will be driven by six electric motors totaling* 4000 *hp at* 3000 *volts dc.*

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Kaiser Interests May Raise Steel Prices to Pay for Fontana

New York

By JACK R. HIGHT
Ass't News-Markets Editor

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• • • **Henry J. Kaiser** opened a new, desperate phase of his protracted negotiations with the Reconstruction Finance Corp. for the reduction of the debt on the war-built Fontana steel plant during the past weeks. Bored at the protracted negotiations which have dragged over months without much sign of a success, the Kaiser interests pulled an ace press release out of their sleeve, and suggested substantial price increases for steel may be the result if no favorable action is taken by the government agency.

With a $41 million payment due from Fontana to the government in 1960, Mr. Kaiser suggested in Washington—the Senate Banking Committee proved an effective sounding board — that he could meet the mortgage by raising his prices any place from $36 to $129 per ton. Assuming peak demand with steel marketing conditions about as they are today for 3¼ years, it would be necessary for Fontana selling prices to go up $129 per ton.

On the other hand, if steel demand should continue to sustain peak operations for 12½ years, it would only be necessary to jump prices by $36 per ton. With 6½ years demand—prices up $67 per ton. An increase of $129 per ton on Fontana plate would put the published base price at $204 per net ton, considerably above the current known gray market prices for plate.

Kaiser officials state that it is possible that a price increase may be made even while negotiations are going on, providing that RFC can't produce some more hopeful sounds down in Washington.

Mr. Kaiser also disclosed that he had discussed in recent negotiations with the lending agency several different proposals for scaling down the debt on the steel mill in the far west, while also furnishing funds for the expansion of the mill. He stated clearly that they were proposals for "converting an unsound RFC loan into a sound one."

They were variations on a plan that would basically use $15 million of Kaiser's shipbuilding profits along with $25 million to be raised from another RFC loan or from the sale of first mortgage bonds (present RFC first mortgage position to be sacrified in favor of preferred stock and common stock) to the public plus $5 million to come from current Fontana earnings or additional private equity.

According to the data submitted by Mr. Kaiser, the earning capacity of the Fontana mill will be five times as great when the modernization and expansion contemplated is completed. This is to include 300,000 tons of increased ingot capacity per year and 750,000 tons of finished steel capacity. He quoted reports by H. A. Brassert calling attention to the need for expanded finishing facilities and one by Arthur G. McKee Co. calling 70 pct of capacity the breakeven point for the mill with existing facilities.

Contributing the swirling of the waters, Mr. Kaiser has the support of a delegation of California congressmen in his efforts to bring the price of the Fontana mill down. Meetings were slated to begin early this week to discuss further possibilities.

Canada's Copper, Nickel Approach 1945 Peaks

Toronto

• • • **While Canadian** production of copper and nickel during November held to about the average rate for the year, output was below that for October.

Copper production for November amounted to 19,043 short tons, compared with 22,664 in October. For the first 11 months of 1947, production of copper totaled 208,134 net tons as compared with 168,046 tons in the like period of 1946 and 220,101 tons in 1945.

Production of refined copper for November amounted to 18,101 tons and the 11 months ending with November to 185,916 tons, compared with 154,540 tons in the 1946 period. Copper exports for the 11 months ending Nov. 30, 1947, totaled 103,363 tons valued at $37,192,709.

Nickel produced in Canada in November amounted to 9871 short tons against 11,487 tons in October. For the first 11 months of last year, production of nickel totaled 106,693 tons compared with 87,459 tons in the same period of 1946 and 114,960 tons in 1945.

Blast Furnace Capacity and Production—Net Tons

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			December	Year to Date	December	Year to Date	December	Year to Date	December	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	12,551,280	939,248	*10,877,952	30,778	*329,235	970,026	*11,207,187	91.2	89.3
Pittsburgh-Youngstown	17	25,042,040	2,036,478	*23,023,515	28,364	216,876	2,064,842	*23,240,391	97.3	92.8
Cleveland-Detroit	6	6,557,500	478,819	5,830,471	.....	.....	478,819	5,830,471	86.1	88.9
Chicago	7	14,097,710	1,048,660	12,546,703	9,132	21,941	1,057,792	12,568,644	88.5	89.2
Southern	8	4,924,670	384,852	*3,982,874	10,991	*123,212	395,843	*4,106,086	94.8	83.4
Western	4	2,536,000	209,815	*2,245,654	.....	11,297	209,815	*2,258,951	97.6	89.0
Total	37	65,709,200	5,097,872	*58,507,169	79,265	*702,561	5,177,137	*59,209,730	92.9	90.1

* Revised.

Source: American Iron & Steel Institute

Steel Expansion in Overseas Countries Still in Talking Stage

Plans Are Plentiful But Work Is Just Beginning On Most Projects

New York

• • • **Prospects for steel** expansion in overseas countries helping the world steel shortage this year are slim. There are many expansion plans, but few of them will be effective before 1950. In many countries it will be at least 2 years after that before new capacity will come into operation.

British steel expansion is progressing about as rapidly as any outside the United States, but it will be late in 1949 before it can offer much aid to wailing steel consumers in that country. The 5-year expansion program was drawn up in 1944-45, but was actually delayed more than a year due to political squabbling and a moderate amount of pigheadedness in dealings between industry and government. A lot of what can be termed normal modernization work within existing mills has been progressing rapidly since the end of the war, but the development of new mills, on new sites, has been subject to endless delays.

The prime project, the South Wales tinplate and strip mill program is now progressing rapidly. The important universal beam mill to be built in the north of England, is still in the talking stage, having been in and out of the hopper several times to date. The development of a new integrated plant on a new Scottish site is still up in the air. No one can get any agreement on the ideal site. The rather slow realization that all is not right in the world scrap supply department has also brought on some hasty revamping of the British plans, and will delay the program still further.

The development of a state owned steel mill in Norway is still in the very early stages, and cannot possibly be in production for 2 years. Strong internal opposition to that project has caused many delays in the years that such a plant has been discussed. Equipment for the project is now ordered, and an organization has been formed to do the job, but it is not likely to materially affect Norway's need for steel exports before 1951.

The Netherlands has been busy drawing up plans to expand and develop the plant at Ymuiden, to work out an integrated steel operation of large proportions there, but this project, too, is a long term one. Some new rolling capacity will be ready this year, as certain reparations are now being shipped to that country, but new capacity will not come in for some time.

France is working on the basis of a modified Monnet plan, with the emphasis on new steel finishing capacity, along with the enlargement of a number of existing furnaces. Basic raw material problems, tied up the need for imported coke and the lean French domestic ores are being attacked directly, before questions of blast furnace design are finally settled. This research will take time, and will further delay the French program.

Substantial amounts of rolling mill machinery for delivery to France are on order, but little will be delivered this year. The first priority for the French industry in 1948-49 is to get back to the maximum output with existing capacity. Substantial expansion is to come about in the 1950's.

Belgians have been extremely secretive as to their expansion plans, but it is now known that the two largest companies in that country are developing major expansion plans. Here, again, the story is the same as in other countries. The plans are just now being put into operation. Orders for machinery must be sandwiched into jammed order books. Construction work must be carried on during strikes, and other interruptions. It will be 2 to 3 years before new capacity can come in.

In Sweden, the government is still pushing its plans to expand production of carbon steel, to supplement the historic production of fine specialty steels in that country. Swedish dependence on Germany for carbon steel imports in recent years has caused much postwar trouble in Sweden. Now, the existing basic steelmaking plants

BACK TO FURNACE: *The back-to-the-furnace movement of former British war equipment continues at top speed. This dump (15 tons) of ex-civil defence steel helmets was among items auctioned at the Ministry of Supply's depot in Tower Bridge road, London.*

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are to be expanded. The blast furnace now in existence in the far north at Lulea is to graduate in 2 or 3 years into a fully integrated producing plant. This project, as a government sponsored venture, has also been subject to many delays and much internal criticism. It can't help the 1948-49 steel supply picture, either.

Spain is also drawing up plans for future steel expansion, but no generally acceptable specifications have been agreed on as yet. This program may expand Spanish steel output by as much as 30 pct when it is completed.

Czechoslovakia has just drawn up plans for new capacity, but actual construction work is not expected to get under way until late in the year. As the orbit of government in business becomes more important in the countries under communist influence, there is at least very little squabbling between private and governmental sources on steel construction. But even universal agreement within the country cannot beat the fact that it takes a long time to build new steel capacity.

This resume only includes a part of the countries that could be mentioned. South Africa, Rhodesia, Egypt, Turkey, Poland, India, Ceylon, Australia, China, Italy, Argentina, and Brazil are all known to have plans for expanding steel capacity, either by enlarging existing units, or building new ones. The story is the same in all of them. It is taking 2 to 3 years from the end of the war to really get expansion programs on the track.

Carnegie Tech Acquires Site for Atom Smasher; Design Voltage Raised

Pittsburgh

• • • **Carnegie Institute** of Technology has acquired a site for its new synchro-cyclotron at Saxonburg, Pa., 28 miles northeast of here. The institute's campus was ruled out to permit expansion of nuclear research in the future. Voltage of the atom smasher will be stepped up over the original design, according to Dr. Edward C. Creutz, associate professor of physics at the institute. He expects the million dollar project to be completed by early 1950 if deliveries are on schedule.

An advisory committee on design for the project is composed of Pittsburgh engineers headed by W. W. Powell of the Mesta Machine Co. Other members of the committee are F. S. Bloom, president, Bloom Engineering Co.; H. L. Cole and R. L. Witzke of the Westinghouse Electric Corp.; Edward Crump, Crump Construction Co.; Dr. B. J. Fletcher, Aluminum Co. of America; J. W. Price, Jr., Carnegie-Illinois Steel Corp.; and R. E. Noble, Mesta Machine Co.

Republic and Tucker Vie for Coke Making Facilities, Furnaces

Washington

• • • **In support of** its bid against the Tucker Corp. for the government-owned blast furnace and coke producing facilities at Cleveland, now under lease to Republic Steel Corp., the steel firm has told WAA that transfer of these facilities to the automotive firm would be against the best interests of national economy.

Republic has offered the flat sum of $4,748,800 cash for the battery of 75 coke ovens and facilities and a proposal to lease the 1300-ton pig iron facilities for a 10 year period with option to buy. The rental agreement, based on production, would guarantee a return of $25,000 monthly.

Five different proposals were submitted by the Tucker Corp., including bids to purchase all facilities for $8 million to $10 million, according to the terms. Rental proposals, including option to buy for as high as $16 million were also submitted by the automotive firm which guaranteed an annual return of $500,000.

Should his firm's bid not be accepted, Tucker suggested, the successful bidder should be required by WAA to furnish the automobile builder up to 20,000 tons of pig iron a month for a 2-year period.

In a telegram to WAA Administrator Larson, President White of Republic declared that should the Tucker firm acquire these facilities, Republic would be forced out of the area's pig iron market with "disastrous effect upon 200 small companies which are dependent upon Republic," thus forcing "many small businesses to close their doors" with an adverse effect upon manufacture of construction materials, freight cars, and agricultural equipment.

Pleads for Industry To Boost Voluntary Allocation Program

Detroit

• • • **Speaking before** a convention of United Roofing Contractors Assn., here, Frank R. Nichols, president, Nichols Wire & Aluminum Co., declared that "the inflationary pressures exerted by the rising costs of steel are tremendous."

"There being not enough steel to go around, there will inevitably be difficulties in its distribution. However, the gray market is important and a most disrupting factor. . . . Estimates as to the amounts of steel reaching the gray market range from 2 to 11 million tons. Let's say that there may be 3 million tons, which is a little less than THE IRON AGE estimates. At an average gray market premium of $100 per ton, that is $300 million.

"If the voluntary (allocation) agreement procedure breaks down, the Administration will be in a position to say to the Congress that the scheme is unworkable, and only Truman's proposals calling for statutory controls can curb inflation.

"Certainly it won't be simple to arrive at or to administer an agreement, but every effort should be made to do so. In the event that nothing constructive can be accomplished, there most certainly will be a concerted drive for control. There is one now."

Shovel Sales Are Doubled

Marion, Ohio

• • • **Net sales of** Marion Power Shovel Co. more than doubled in 1947 while profits rose nearly 7-fold, according to Harvey T. Gracely, president.

Preliminary figures indicate that net profit after taxes will be approximately $900,000 compared with $129,455 in 1946. Net sales amounted to more than $19,500,000 compared with $9,415,986 in 1946.

Mr. Gracely predicted that sales "will be at the rate of more than $25,000,000 for the year," adding that the company backlog was the largest in its history.

American Foundrymen Officers Nominated for Election in May

Chicago

• • • **William B. Wallis,** president of Pittsburgh Lectromelt Furnace Corp., has been nominated for president of the American Foundrymen's Assn. in 1948-49, according to William W. Maloney, Chicago, secretary-treasurer of the international technical society of the castings industry.

William B. Wallis

Choice of AFA's 1948 nominating committee to succeed Max Kuniansky, vice-president - general manager of Lynchburg Foundry Co., Lynchburg, Va., whose term expires in July, Mr. Wallis is the present vice-president. He served as an international director from 1943 to 1946.

Max Kuniansky

Edwin W. Horlebein, president of Gibson & Kirk Co., Baltimore, who completes a 3-year term as a director of the 10,000-member society in July, is the nominating group's selection for vice-president.

Edwin W. Horlebein

On his retirement as president, Mr. Kuniansky will serve one year as an AFA director, succeeding Sheldon V. Wood, president - general manager of Minneapolis Electric Steel Casting Co., immediate past president of the association.

Named for 3-year directorships are: Thomas H. Benners, Jr., managing partner in T. H. Benners & Co., Birmingham; Norman J. Dunbeck, vice-president of Eastern Clay Products, Inc., Jackson, O.; Andrew M. Fulton, vice-president of Northern Malleable Iron Co., Saint Paul; Robert R. Gregg, foundry manager of Reliance Regulator Co., Alhambra, Calif., and Victor E. Zang, vice-president of Unitcast Corp., Toledo.

Elections will be held at the annual business meeting during AFA's 52nd convention and foundry show in Philadelphia, May 3-7.

Record Tonnages Iron Ore, Coal, Limestone Moved on Great Lakes

Cleveland

• • • **Record peacetime** tonnages of iron ore, coal and limestone were moved by the Great Lakes fleet during the 1947 shipping season, John T. Hutchinson, president Lake Carriers Assn., revealed last week.

Mr. Hutchinson reported a total iron ore movement of 77,898,087 gross tons, or 86,245,857 net tons, a new peacetime record surpassing the 1929 total by more than 12 million gross tons, and representing more than 99.87 pct of the quota set for the fleet at the start of the season.

Total movement of coal was 58,059,884 net tons, also a new peacetime record, and exceeded only in 1944, a war year, when 60,163,330 net tons were moved.

Movement of limestone totaled 20,891,130 net tons, a new all time record surpassing 1945, biggest war year, when shipments were 18,717,773 net tons.

Total 1947 lake movement was 176,648,110 net tons of iron ore, coal, limestone and grain, far surpassing the 1929 total of 138,574,441 tons and last year's (1946) total of 147,955,458 net tons—and almost matching the average of the 5 wartime years, 1941-46, which was 177,982,579.

Ore carriers of U.S. registry in 1947 numbered 274 and Canadian ore carriers contributing to the above totals numbered 39.

Commenting on the record season, Mr. Hutchinson pointed out that although heavy ice conditions in the early spring and stormy November weather made shipping operations difficult, "we were favored during most of the season by good weather and a minimum of mechanical failures."

Gillies Resigns From Office at Republic

Cleveland

• • • **After 55 years** in the mining and steel industries, Donald B. Gillies has resigned as vice-president and director, Republic Steel Corp. Mr. Gillies, who celebrated his seventy-fifth birthday Nov. 4, will, however, remain with Republic as an adviser and consultant on mining.

Donald B. Gillies

He has been in large part responsible for the renewed interest in and development of ore mining in the Northern Adirondack region.

Mr. Gillies recently took a leading part in the acquisition by Republic of an iron ore mine in Mexico.

Internationally known as an authority on mining, in 1939 Mr. Gillies was honored by his professional associates in the mining industry by being elected president, American Institute of Mining & Metallurgical Engineers, in which he had taken an active part throughout his professional career. He was recently elected president, Lake Superior Iron Ore Assn.

Niles Rolling Mill Plans New Bar Mill Addition

Niles, Ohio

• • • **A $350,000 expansion** program which will include a plant addition of 13,500 sq ft of floor space for a new bar mill was announced by James A. Roemer, president, Niles Rolling Mill Co.

This expenditure is in addition to an expenditure of $354,000 during 1946-47 at the plant, which increased steel rolling capacity to 125,000 tons annually. The 13,500 sq ft addition will house a new bar mill, a new 3-high mill, motor and drive and furnace facilities. Pack shears and scrap baler will be relocated.

Work on the project will begin within a few days and if equipment is delivered promptly, the program should be completed within six months, Mr. Roemer said.

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Industrial Briefs . . .

• PURCHASES FOUNDRY—Chapman Valve Mfg. Co., Indian Orchard, Mass., has purchased for $916,000 from the WAA the foundry adjoining its main plant which has been operated under lease from the United States government.

• MERGER — Newcomb-Detroit Co., Detroit, engineers and manufacturers of finishing and dust arresting systems, has recently acquired the Newcomb Engineering Co. of Grand Rapids, which will be known as the Grand Rapids Div.

• MOVES—Frederic B. Stevens, Inc., manufacturers of foundry and metal finishing equipment and supplies, has moved their general offices and warehouse to 1800 18th St., Vernor Highway West, Detroit 16.

• ACS OFFICERS—Dr. Linus C. Pauling, chairman of the division of chemistry and chemical engineering of the California Institute of Technology has been elected president of the American Chemical Society for 1949 and is president-elect for 1948. Dr. Charles A. Thomas, executive vice-president and technical director of the Monsanto Chemical Co., St. Louis, is president this year.

• CHANGES HANDS — The purchase of the Corey Steel Co., 2800 S. 61st Court, Cicero, Chicago, by a group of metal men has been announced. Henry W. Angsten will be chairman of the board, Earl W. Whiteway, president, and Paul J. Darling, vice-president-in-charge-of-sales.

• TO BUILD UTICA PLANT—Announcement has been made by the Chicago Pneumatic Tool Co., New York, portable power tool manufacturers, that it will start construction in April of a New York State plant in Herkimer County on the outskirts of Utica, in the township of Frankfort.

• INSTITUTE ELECTION — Announcement of the election of the following officers has been made by the Brass & Bronze Ingot Institute: President, Leo Halpern, Federated Metals Div., American Smelting & Refining Co., New York; vice-president, Marvin M. Cohn, L. A. Cohn & Bros., Inc., Chicago; treasurer; Howard K. Chapman, H. Kramer & Co., Chicago.

• ALUMINUM DISTRIBUTOR — Permanente Products Co., Inc., Oakland, Calif., has announced the appointment of Hill Chase & Co., Inc., as distributors of Kaiser aluminum with warehouse location at Trenton and Ontario Streets, Philadelphia.

• AMERICAN OUTLET — Central Industries Ltd., exporters and importers, located at 30 Church St., New York, has announced their appointment as exclusive distributors in United States and Canada for A/B Fr. Ramstrom, Swedish manufacturers of precision metalworking machinery.

• SELLS PROPERTY—The Detroit Steel Corp., Detroit, has announced the sale of the land and buildings of its Cleveland branch to Reliance Electric & Engineering Co. A new Cleveland plant for Detroit Steel will be ready in a few months.

• VALVE REPRESENTATIVE—Appointment of the Charles H. Tate Co., 992 Union Commerce Bldg., Cleveland, representative of Edward Valves, Inc., East Chicago, Ind., for Northern Ohio and Erie County, Pa., has been announced.

• NEW LOCATION — Armstrong Bros. Tool Co. has made announcement of its new general offices and works at 5200-5300 W. Armstrong Ave., Chicago 30.

• BUYS HOIST FIRM—The National Screw & Mfg. Co., Cleveland, announced that it has purchased the Chester Hoist Co. of Lisbon, Ohio. George Neilson Bolton has been named manager.

November Canadian Pig Iron Output Highest During Last Year

Toronto

• • • **Canadian pig** iron production in November amounted to 174,147 net tons or 76.1 pct of total rated capacity, and was the highest monthly rate since January, when output amounted to 177,313 tons, and compares with 163,335 tons for October when the average was 71.4 pct, and with 135,269 tons in November 1946.

Production for November last included 148,845 tons of basic iron, of which 138,761 tons were for further using of producing companies and 10,084 tons for sale; 12,346 tons of foundry iron with 183 tons for further use and 12,163 tons for sale, and 12,956 tons of malleable iron all for sale. Charges to blast furnaces in the month under review included 319,698 tons of iron ore; 18,539 tons of mill cinder scale, sinter, etc., and 5898 tons of scrap iron and steel. Throughout November, 11 of the 14 blast furnaces in Canada were in blast.

For the first 11 months of 1947 cumulative production of pig iron in Canada totaled 1,804,296 net tons, and compares with 1,242,294 tons in the 1946 period and 1,642,733 tons in 1945.

Ferroalloys produced in November amounted to 11,551 net tons, against 14,691 tons in October and 9370 tons in November 1946. For the month under review, production included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus.

For the 11 months ending with November, production of ferroalloys totaled 138,944 net tons as compared with 105,229 tons in the corresponding period of 1946 and 171,522 tons for 1945.

Following are comparative monthly figures for pig iron and ferroalloys in net tons:

	Pig iron	*Ferroalloys*
January	177,313	9,644
February	150,632	9,357
March	164,403	14,191
April	160,749	13,015
May	160,230	15,325
June	159,826	16,212
July	157,153	12,402
August	166,978	11,398
September	169,630	11,152
October	163,335	14,691
November	174,147	11,551
Total 11 Months	1,804,296	138,944

Weekly Gallup Polls . . .

Majority Frowns on Wage Boosts Leading to Higher Prices

Princeton, N. J.

• • • **Although there is pressure** from workers for a "third round" of wage increases, the general public is beginning to frown on wage boosts if they lead to increases in the price of goods, according to George Gallup, director, American Institute of Public Opinion.

That is shown when the issue of wage and price increases was put to the public in a nationwide poll, as follows:

"Some people say workers' wages should be increased again because of today's high prices. Other people say that if wages are raised, prices will go still higher. How do you stand on this — are you for or against increasing the wages of workers?"

The vote is:

	Pct
For	31
Against	53
Qualified	7
No opinion	9

The demand for wage boosts is being led by organized labor. One of the CIO "big three," the United Electrical, Radio and Machine Workers of America, recently announced that it will demand substantial wage increases to offset the $13.03 a week in real income which it estimates that its workers have lost in the past 2 years because of higher prices. There has also been talk of new wage demands by the United Automobile Workers.

When recent poll results are analyzed according to occupation groups, it is clear that the classic economic argument about wage boosts leading to price boosts has gained the least acceptance among labor union members and among manual workers generally.

Among union members the weight of sentiment, numerically speaking, is on the side of wage boosts regardless of possible effect on prices.

There is a close correlation between attitudes on this issue and extent of formal education of the voter. Among college trained people the theory of the relationship between prices and wages has widest acceptance; among voters who have not gone beyond grade school, and who have thus probably not attended classes in economic theory, it has the least acceptance.

However, the matter is not entirely related to degree of education. Economic status undoubtedly plays a vital role in determining people's attitudes toward this issue; a family which is having extreme difficulty living on a small wage will likely favor a wage boost irrespective of what may happen to prices. It is forced to think about tomorrow's bills rather than about long-range economic theory.

In the recent poll the voters expressing qualifications to their opinion said mainly: "Depends on the individual case," and "Let wages stay and reduce prices."

•

• • • **President Truman's** request to Congress for a peacetime military training bill finds public sentiment receptive. However, the proportion of voters in favor of universal military training is smaller today than it was 6 months ago.

If the country were to vote in an official referendum on the much-discussed UMT program, approximately two-thirds would favor it today, as shown by the results of a nationwide unofficial sampling referendum by the institute.

The vote:

"Do you think Congress should or should not pass a law to require every ablebodied young man (who has not already been in the armed forces) to take military or naval training for 1 year?"

	Pct
Should pass law	65
Should not	24
No opinion	11

A previous poll on the issue, reported July 25, 1947, showed a vote of 75 pct in favor, 18 pct opposed and 7 pct without opinions. The question read: "In the future do you think every physically-fit young man (who has not already been in the armed forces) should be required to take military or naval training for 1 year?"

In measuring attitudes on this controversial issue facing the new Congress, the institute used its new, multiple-question technique which makes it possible to probe opinion from many aspects.

Truman's Request for Peacetime Military Training Bill Gains Endorsement by General Public

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For example, the survey tested voter-awareness of the arguments for and against military training, recorded intensity of sentiment, measured the attitudes of people who have a member of the family of draft age.

It found that:

(1) Majorities in every section of the country favor peacetime training.

(2) Veterans of World War II show a higher percentage in favor than the population as a whole.

(3) The best argument for UMT, in the opinion of the people questioned, is the need for preparedness and protection while the world is upset. The second best reason given by voters is that it is good training and good discipline for young men.

(4) The s t r o n g e s t reasons against UMT, voters say, are that it is unfair to young men to take a year out of their lives, disrupting their education, and that it will encourage war and war-like attitudes.

(5) Persons who have a male member of the family of draft age vote in favor of military training by almost the same percentage as those who have no family member that would be affected by UMT.

(6) Although some labor union leaders have opposed UMT, the rank and file of union members questioned in the poll showed a vote of approval of nearly 3 to 1 of the training program. The occupation group least in favor are the farmers of the country.

(7) Intensity of sentiment is about the same on both sides of the issue.

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Construction Steel . . .

New York

• • • **Shipments of fabricated** structural steel for the year 1947, according to reports received by the American Institute of Steel Construction, Inc., amounted to 1,915,144 tons, an increase of 23.4 pct over the 1,551,607 tons shipped in 1946 and 30.7 pct over the shipments in the averaged prewar years 1936 to 1940.

Bookings amounting to 1,628,756 tons did not quite equal last year's, but were 8 pct over the 1,509,496 tons reported in the prewar years. The tonnage available for fabrication at Dec. 31, 1947, was 671,091 tons as compared with 646,090 tons at the end of the previous year.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry 1947	Estimated Total Tonnage for the Entire Industry avg. 1936-1940
Contracts Closed		
January	104,973	107,578
February	125,881	96,280
March	149,634	124,558
April	161,338	110,783
May	112,954	126,237
June	103,273	125,835
July	153,540	152,481
August	146,382	113,135
September	134,630	137,982
October	159,132*	141,557
November	132,916*	129,757
December	144,103	143,313
Total	1,628,756	1,509,496
Shipments		
January	140,650	92,578
February	136,126	88,626
March	137,799	115,031
April	157,392	123,650
May	154,980	123,225
June	151,882	129,969
July	169,911	127,422
August	157,952	136,389
September	164,345	137,255
October	196,139*	140,944
November	175,000*	127,873
December	172,968	121,664
Total	1,915,144	1,464,626
Tonnage available for fabrication within the next 4 months	671,091	363,288

* Revised.

• • • **Fabricated steel awards** this week included the following:

500 Tons, Chicago, building for Perkins Products Inc. to Duffin Iron Works, Chicago.

400 Tons, Chicago, building for Darling & Co., to Duffin Iron Works, Chicago.

185 Tons, Loveland, Col., structures for switchyard, Estes Power Plant, Bureau of Reclamation, Denver, Spec. 2027, to Bethlehem Steel Co., Bethlehem.

• • • **Fabricated steel inquiries** this week included the following:

1185 Tons, Harlan County, Neb., service bridge dam, Republican River, through U. S. Engineers' office, Kansas City.

1085 Tons, Ashtabula, Ohio, manufacturing building, E. I. du Pont de Nemours & Co., Feb. 2.

400 Tons, Reading, Pa., Parish Pressed Steel Co., bids in.

350 Tons, Clay County, Ill., state highway bridge section 18F. Bids close Feb. 6.

260 Tons, Cumberland County, Ill., state highway bridge section F-X-M. Bids close Feb. 6.

250 Tons, New Brunswick, N. J., agricultural college building, State of New Jersey, Feb. 18.

125 Tons, Renova, Pa., bridge, Pennsylvania R.R.

125 Tons, Chicago, warehouse for Illinois Bell Telephone. Bids close Feb. 6.

• • • **Reinforcing bar awards** this week included the following:

325 Tons, Harlyville, S. C., building for the Carolina Giant Cement Co., to Bethlehem Steel Co., Bethlehem.

310 Tons, Springfield, Ill., power house for State of Illinois, previously reported to John Felmy Construction Co. of Bloomington, at 430 tons, final tonnage 310 tons, which was taken by Bethlehem Steel Co.

300 Tons, Morgantown, W. Va., building for the Worth Coal Co., through McDonald Engineering Co. to Bethlehem Steel Co., Bethlehem.

200 Tons, Akron, Ohio, state highway bridge through Bates & Rogers Construction Corp., to Bethlehem Steel Co., Bethlehem.

• • • **Reinforcing bar inquiries** this week included the following:

1150 Tons, Los Angeles, undercrossings and separation structures on Hollywood Parkway at Figueroa St., California Div. of Highways, Los Angeles, bids to Feb. 19.

900 Tons, Iron Mountain, Mich., veterans' hospital through U. S. Engineers, Gus Newberg Construction Co., Chicago, low bidder.

335 Tons, Friant, Calif., canal and structures, 3 miles south of Woodlake to about 2 miles east of Lindsay, Calif., Friant-Kern Canal, Bureau of Reclamation, Friant, Spec. 2074, bids to Feb. 26.

• • • **Railroad car awards** this week included the following:

The Denver Rio Grande & Western has ordered 250 70-ton gondola cars from the Pullman Standard Car Mfg. Co., Butler, Pa. Illinois Central R.R. has ordered 1000 50-ton hopper cars from Pullman Standard Car Mfg. Co. at Bessemer, Ala., and 1000 50-ton hopper cars from the General American Transportation Corp., East Chicago.

• • • **Railroad car inquiries** this week included the following:

The Union Pacific R.R. closed its inquiry Jan. 27 on 50 sleepers and 50 passenger coaches. The Pacific Fruit Express is inquiring for 3000 refrigerator cars. The Santa Fe R.R. will order 135 sleepers to be built entirely of stainless steel exteriors.

German Factory Moved

London

• • • **All the equipment** of a German machine tool factory at Stuttgart has been bought from the British Government by B. S. A. Tools, Ltd., and is being moved to Redditch. It is believed to be the first factory acquired as reparations to be transported to Britain. German designers and technicians, who will become permanent members of the staff of the B.S.A. Tools, will come over with the plant. It is stated that by the time the factory starts up at Redditch it will have cost nearly $2 million.

Coming Events

Jan. 29-30 **Wirebound Box Manufacturers Assn.**, annual meeting, Hollywood, Calif.

Feb. 10-11 **Pressed Metal Institute**, annual meeting, Buffalo.

Feb. 15-19 **American Institute of Mining and Metallurgical Engineers**, annual meeting, New York.

Feb. 28, March 1-2 **American Metallizing Contractors Assn.**, meeting, Cleveland.

Mar. 1-4 **American Society of Mechanical Engineers**, meeting, New Orleans.

Mar. 3-5 **Society of Automotive Engineers**, national passenger car meeting, Detroit.

Mar. 15-19 **ASTE Industrial Exposition**, Cleveland.

Mar. 18-19 **Magnesium Assn.**, annual meeting, New York.

Apr. 5-8 **Southern Machinery and Metals Exposition**, Atlanta.

Apr. 5-8 **National Assn. of Corrosion Engineers**, annual conference and exhibition, St. Louis.

Apr. 7-9 **American Society of Civil Engineers**, meeting, Pittsburgh.

Apr. 12-14 **Openhearth Steel Committee and Coke Oven, Blast Furnace and Raw Materials Committee, AIME**, annual conference, Pittsburgh.

May 3-7 **American Foundrymen's Assn.**, convention and show, Philadelphia.

May 20-21 **Society of the Plastics Industry**, annual meeting, Atlantic City, N. J.

Some Variations Predicted in Union Demands on Fabricators

Survey Indicates One Company Out of Four May Not Get Basic Steel Demands

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By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

o o o

Pittsburgh

• • • **The third round** wage increase which the United Steelworkers of America will probably demand of steel fabricators will not follow the basic steel pattern in all cases. One plant in every four will probably receive demands modified in the light of local conditions. Wage increases and other provisions will vary by an even wider margin if last year's contracts are any criterion.

This information comes from a survey of the 1946 USWA-CIO contracts of 133 steel fabricators. Three contracts recently renewed in small metalworking plants in Akron, Ohio, are not identical either. The survey was made by the Non-Basic Steel Coordinating Committee. The Akron plants in which contracts were renewed were Akron Metal Stamping Co., Alsco, Inc., and Johnson Steel & Wire Co. They employ about 55, 175 and 60 people respectively.

If there is any question of the probability of a third round wage demand on basic steel the current issue of "Steel Labor," monthly publication of the United Steelworkers of America, should settle it. Aside from the original prediction in THE IRON AGE (Nov. 27, 1947, p. 113) and reiteration by numerous union officials, it is now in print in the union paper. "Steelworkers," the article says, "need a wage increase: The steel industry can afford to pay it."

Whether this will be carried bodily over to steel fabricators is still undisclosed. For some this has been a boom year; for others it has been a nightmare. Some are hanging on by the skin of their teeth, taking quota cuts, buying in the gray market and running on a start and stop basis. If they can get the variations this survey shows have been introduced into some contracts their chances of survival are believed to be better.

The Non-Basic Steel Coordinating Committee was formed in 1946 to combat what it termed the arbitrary formula which the steelworkers sought to impose on all the companies with which it had contracts prior to the 1946 strikes in basic and non-basic steel. Its purpose was to sell the public and the government on the fact that makers of steel products had individual problems that should not be lumped together under a set pattern of union demands. It sought local bargaining on individual plant levels rather than "industry-wide bargaining."

At present this committee is not functioning. After a flurry of activity in support of the Taft-Hartley bill it was put on ice. There it remains with the prospect of revival within the next month or so if it appears that its membership will be presented with fixed demands on an industry level.

From its survey report it is impossible to say just how its members' contracts vary by area and size of plant. It is certain only that the contracts do vary. Asked if the union based its wage demand on the 1947 basic steel settlement, 89 companies answered yes; 28 said no. Some 84 said there was bargaining in the light of local conditions; 33 said there wasn't.

At this point statisticians may start multiplying these figures by 10, on the theory that there are about 1200 USWA contracts. These 133 replying companies might therefore be considered a cross-section of the metalworking plants having USWA contracts. This can't be done. It might be correct but there isn't enough data to prove it. The membership list reads like a cross-section of the industry. Replying companies employ from 20 to 3600 people with an average of 355. But no data was tabulated on the size or location of replying plants, the survey simply shows variety. It doesn't detail it.

Since the passage of the Taft-Hartley bill at least one large steel fabricator in the Pittsburgh district signed a steelworkers con-

STUDEBAKER STEEL: *This is an air view of the Empire Steel Corp. plant at Mansfield, O., recently taken over by Studebaker Corp. The plant cost Studebaker $7,400,000. The sheet mill is in the immediate foreground, machine shops and stamping plants are in the center and in the background are buildings housing six openhearth furnaces, blooming and bar mills. Estimated capacity is 350,000 ingot tons per year.*

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tract this summer without a non-suability clause. The three agreements more recently negotiated with the Akron metalworking firms mentioned above all have such a clause. Two of them protect the company with a no-strike clause. This is backed by an agreement that any employee may be discharged or laid off for an unauthorized walkout and can't appeal through the grievance procedure. Two of the contracts grant no pay increase though one of these companies has profit sharing. One contract gave a 10¢ per hr pay boost and a 2 week vacation for 2 years' work. The 10¢ increase was in base pay in a company using an incentive system.

Of the contracts reported on by the 133 replying members of the Non-Basic Steel Coordinating Committee there were 51 that granted retroactivity and 69 that did not. Reopening on wages is included in 94, excluded from 26. Contracts were written for a year in 29 cases; for 2 years in 86. Expiration dates are pretty well lumped in May and June, though 14 expire this April.

There were 13 strikes in 1947 in the reporting companies. This should be taken in connection with the replies on bargaining in the light of local conditions, according to a spokesman for one of the member companies in the Pittsburgh district. His company local, he said, had bargained in the light of local conditions, but not until after 8 weeks of strike.

Wage increases averaged 11.8¢ per hr. Increases of 15¢ were granted by 10 companies; 40 gave 12½¢; 15 gave 10¢; 5 made it 9¢, with the rest scattered between the two extremes. Here again no area pattern is obtainable but observers say the wage pattern usually follows the big companies in any area.

Export Price Revisions Are Issued for Main Carbon Steel Products

New York

• • • **New schedule of** the U. S. Steel Export Co.'s export base prices, effective Feb. 1, reflecting revised published tariff freight rates covering iron and steel products for export, has been issued. The schedule covers the principal carbon steel products with freight included to New York, Philadelphia or Baltimore. All prices are net cash and subject to adjustment to seller's price in effect at time of shipment from the mill. Prices, per 100 lb unless otherwise noted, are as follows:

Billets, blooms and slabs, per gross ton	
Rerolling quality	$58.38
Forging quality	68.38
Skelp	3.28
Standard structural shapes	3.48
Plain plates	3.73
Floor plates	4.98
Hot-rolled bars	3.73
Concrete reinforcing bars	3.58
Fabricated conc. reinforcing bars	4.18
Steel sheet piling	3.98
Hot-rolled strip	3.48
Tight copper age hoops	3.78
Rails, per net ton	
Standard—61 lb and over	70.57
Light—60 lb and under	74.92
Girder rails	77.36
Joint bars for standard rails	4.95
Tieplates	4.95
Tinplate American coke, #107, per base box	
1.25 lb coating	7.90
1.50 lb coating	8.10
Tinplate Ferrostan unassorted, #107, per base box	
0.25 lb coating	7.10
0.50 lb coating	7.30
0.75 lb coating	7.50
Special coating mfg. ternes, unassorted, #107, per base box	7.20
Mfg. ternes, unassorted, #107, per base box	7.70
Sheets	
Hot-rolled, 18 ga. & heavier	3.66
Hot-rolled, 19 ga. & lighter	4.51
Cold-rolled, 15 ga.	4.36
Galvanized, plain, 10 ga.	4.63
Galvanized, corrugated, 10 ga.	4.73
Wire rods, per gross ton	75.63
Cold-rolled strip, 0.25 carbon & under	4.23
Bright nail wire	4.23
Black annealed wire	4.88
Galvanized plain wire	5.33
Barbed wire, per 80 rod spool	
Lyman, 4 pt. 5 in.	5.62
Glidden, 2-pt. 4 in.	5.15
Cold-finished bars	4.20
	Discount, Pct
American Standard Pipe T&C	
Buttweld—2½ & 3 in.	
Black	51.2
Galvanized	36.7
Seamless—3½ to 6 in.	
Black	46.2
Galvanized	31.2
English gas tubes T&C	
Buttweld—2½ & 3 in.	
Black	50.5
Galvanized	39.0

50 YEARS AGO

THE IRON AGE, *January 27, 1898*

• "The new warehouse built recently in Philadelphia by Horace T. Potts & Co. for the storage of iron and steel, is in the Gothic style of architecture. The roof overhangs about 6 ft and is decorated on the underside in Florentine style. The imposing appearance presented by the building has already earned for it from passers by the title of 'Fort Potts.'"

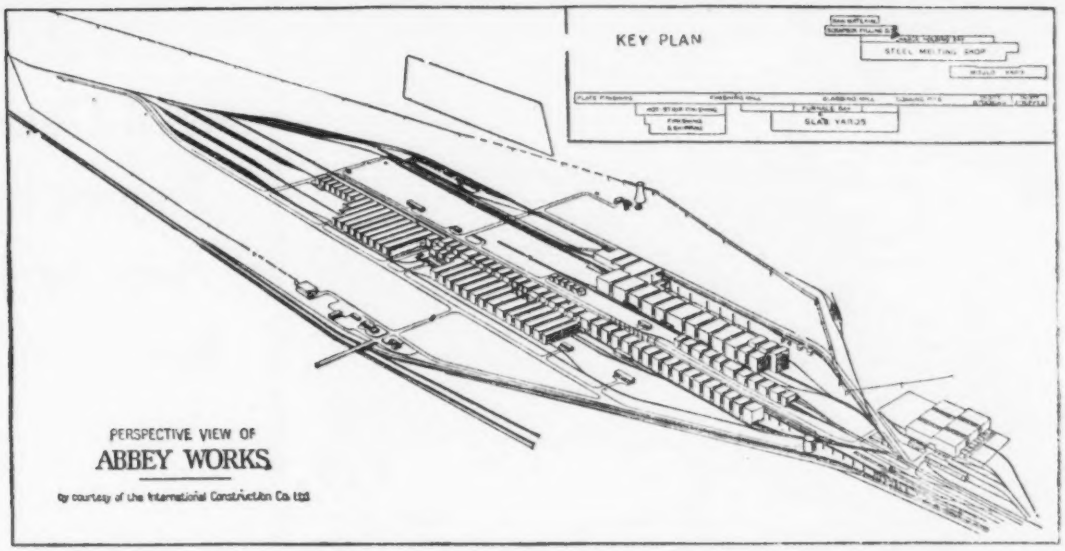
• **"The Edison experiments in New Jersey with the concentration of low grade ores has attracted no little interest from those who are acquainted with the vast deposits of low grade magnetites on the East Mesaba range."**

• "Washington — There is a strong movement on foot in Congress to push adoption of the metric system of weights and measures through passage of a bill introduced by Rep. Hurley of New York. He believes this would further open up the machinery export field as at present our chief difficulty lies in the fact that our goods are made on a basis of measurement entirely foreign to that understood in the markets we wish to enter."

• **"Brown & Sharpe Mfg. Co., Providence, R.I., have announced substantial reductions on horse and hair clippers which range from 10 to 40 pct."**

• "At the third annual convention of the Manufacturers Assn. held in New York this week, Fletcher W. Hughs of Orange, N. J., delivered a paper entitled 'Our Consular Service and Commerce.' He strongly urged that every U. S. consul and commercial agent should be a naturalized American citizen and be able to speak the language of the country to which he is assigned."

• **"A new product manufactured under the name of silica fibre is reported to be a mineral wool free from sulfur. It has been developed for insulating and sound deadening purposes."**



British Steel Expansion to Utilize U. S. Materials and Techniques

NINE months ago, the site of the new Abbey Works of Steel Co. of Wales near Port Talbot was salt marsh and sandhills. Here at any rate is a project which is abreast of its schedule, and a good start is all important in a scheme which is likely to take five years.

Steel Co. of Wales is a joint undertaking of the four leading steel and tinplate concerns in South Wales. It is taking over old-style tinplate and sheet works from Richard Thomas and Baldwins, John Lysaght, and Llanelly Associated Tinplate, and these companies contribute to its capital resources. Much of this plant will be superseded when the new hot strip mill and the two (possibly three) cold reduction plants for sheet and tinplate are in operation. The industry will then be based on a new plant capable of rolling hot strip steel 80 in. wide—a bigger and more versatile version of the continuous strip mills which have proved such a success at Ebbw Vale and Shotton—at a new site alongside the existing Guest Keen Baldwins works at Port Talbot and Margam. This plant will integrate the entire process of strip steel making, from the manufacture of pig iron to the final product, hot strip, which races off the mill at 30 mph. Hot strip then requires further processing in cold reduction mills before it emerges as sheet steel for motorcars and many other purposes. Similar treatment and coating with tin is necessary to produce tinplate.

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The full scheme (including a third cold reduction plant, if this is decided on) will cost, according to a prospectus estimate last July, some $240 million. Of this sum, $60 million has been raised by the public issue of 3 pct, debenture stock, 1952-57, and the company has arranged with Finance Corp. for Industry for loans of up to $140 million. In a project of this sort, compromise is inevitable between the optimum siting and layout of plant and what have been described by government spokesmen as "sociological factors." The main controversy has been concerned with the finishing plants—the tinplate works are, finally, to be put at Llanelly, but a decision has still to be reached whether the cold sheet mill should be at Newport (45 miles to the east) or attached to the new hot strip mill.

But the first task is to proceed at Port Talbot, for the new steel works and hot strip mill there are the core of the entire scheme. The work that has been achieved here during several months of continuous fine weather is quite remarkable. Where, at the end of April, all was marsh, a large part of the task of shifting 5 million tons of sand by digger, truck and dredger to fill the site has already been done. The bare outline plan of a new works is already becoming visible in roads, railway sidings and drains, and the "fill" is being knit together with 30,000 piles and inset with concrete foundations for the new plant. Even in this preparatory stage generous use is being made of American plant of various types. In the new works, when they are in operation, the basic techniques will be no less derived from America. The continuous strip mill is an American development, and this plant and much of the cold reduction plant can only be obtained from the United States—at an estimated total dollar cost of about $22 million. The new ore unloader (the first of three to be installed at the Port Talbot dock) will handle 500 tons of ore an hr, and will be supplied by a British firm from the design of an American firm with which it is associated. American technique is also incorporated in the new blast furnace at the Margam works. The 8 (ultimately 12) Venturi steel furnaces, again, are of a design originally developed in the United States, though they will be built in this country. They will be oil-fired and of 200-ton capacity—there are at present only 19 steel furnaces of comparable capacity in this country. To stress the importance of American technique in many sections of the South Wales project is in no sense to belittle what is being set on foot, but rather to underline its already conspicuous promise of suc-

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cess. Large scale integrated steel plants are not unknown in this country, but it is in America that plants of the size contemplated in the Steel Co. of Wales scheme have already shown their great merits.

The scale of output, when the scheme is completed, will be prodigious. At the blast furnaces, 6000 tons of limestone, 14,200 tons of coke (requiring over 20,000 tons of coking coal), 28,000 tons of imported iron ore and 7000 tons of home ore will be required each week to produce 16,200 tons of pig iron for the steel works. In the latter (including the rebuilt portions of the existing Port Talbot works) 29,000 tons of steel ingots should be produced each week (involving the use of about 9000 tons of purchased scrap), of which 25,000 tons will proceed to the slabbing mill, and will emerge at the end of the process as 20,000 tons of hot strip and plates. The scheme is based fundamentally on the use of rich imported ores, local coal from the neighboring valleys and limestone produced from the company's highly efficient new quarry. There are technical arguments in favor of the use of non-phosphoric ores for sheets and flat-rolled products, and since it is obvious that the British steel industry cannot base itself wholly on home ores (which in any case are phosphoric), the siting of a new works of this kind on the seaboard, and close to local coal and limestone, should minimize the cost of handling raw materials.

In a large project of this kind, the layman, if he is wise, will give the engineers their heads, so long as they can produce a comprehensive and coherent account of the sort of plant they want to build. There emerges from the mass of technical description of the new plant and its various appurtenances an impression of common sense economy. The conservation of heat is an integral feature of the scheme; the steel plant is on a scale sufficient to satisfy the voracious appetite of one of the biggest hot strip mills in the world; a good deal of thought has been given to the problem of keeping the older plants in production until the new are ready, and to the gradual dovetailing of their operations; there are to be a new coal washing plant, an additional battery of 90 modern coke ovens, a new byproduct plant,

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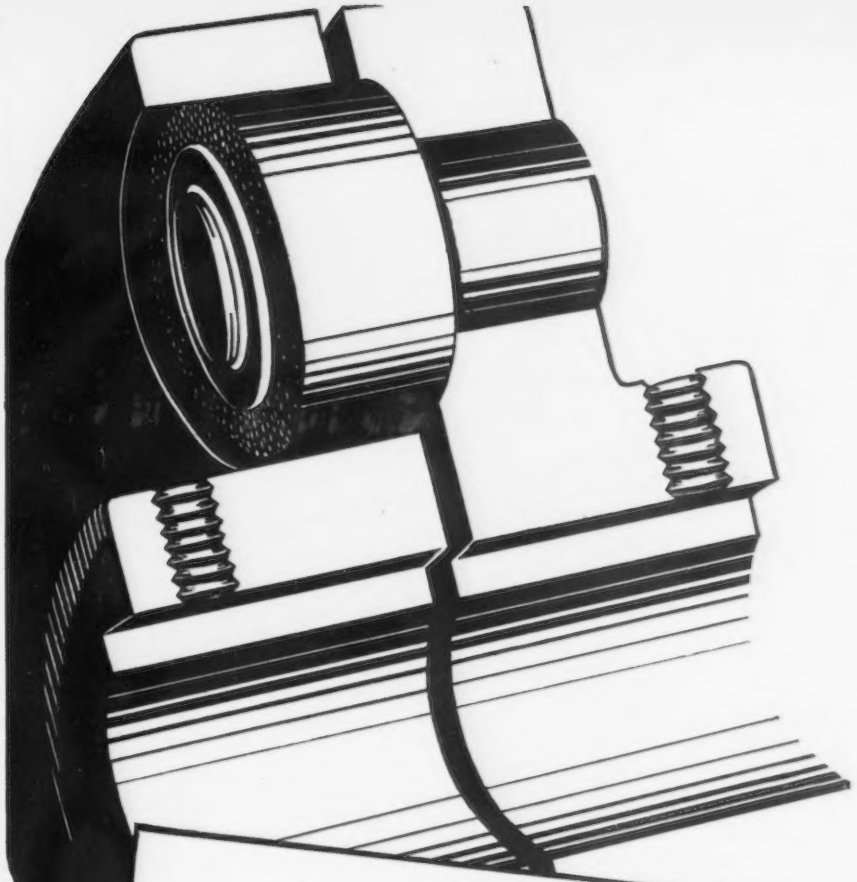
a central repair shop, ancillary equipment of every kind for the steel shops. The electric drives for the slabbing mill and strip mill are being provided by British firms.

All this and a much wider range of miscellaneous equipment is at present under contract with the various supply firms. It remains to be seen whether the flying start which has been made this summer on the site will be matched by similar speed in erecting the new works and plant.

In the year before the war the production of steel sheet, coated and uncoated, amounted to 816,000 tons, and of tinplate and blackplate to 610,000 tons; in 1946 the respective total for sheets was 1,186,000 tons and for tinplate 584,000 tons. The former shows the pace which has been made by the new strip mills; the latter figure for tinplate shows the effect of an industry in technical decadence. In 1938, 325,000 tons of tinplate were exported; in 1946 the figure was 117,000 tons—and this despite the fact that a greater supply of tinplate abroad would have provided in return an increased supply of tinned foodstuffs for the British consumer. Steel Co. of Wales will be capable of adding a million tons of sheets or tinplates to these figures by the early fifties. At a time of universal shortage such an increase does not seem at all excessive, and even when due allowance is made for the weakening of the sellers' market and for the emergence once more of international competition in steel products, cheaply produced sheets and tinplate of high quality ought to be capable of holding their own, whereas the output of the old-style tinplate mills is a luxury which can only be afforded in a period of acute scarcity.

For here is precisely the kind of project which should have been put under way between the wars, for the lack of which the steel industry (with scarcely an exception) was so rightly criticised. It comes later than it need have done, and at an awkward period of economic strain. But in ten years' time it may well be regarded as one of the outstanding achievements which British industry had to its credit during the turbulent difficulties of the post-war period.



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Tin Allocations For First Half of 1948 At 17,703 Long Tons

Washington

• • • **The Combined Tin Committee** has announced interim allocations of tin metal for the first half of 1948 amounting to 17,703 long tons. The allocations represent more than half of the total allocation that each country can expect for the first 6 months of this year, in view of the estimated production of tin available for export up to June 30, 1948, and after taking into account the probable requirements of many countries which have not yet been presented to the Committee.

The Committee has expressed regret that the supplies of tin metal available for allocation during the first 6 months of 1948 will fall short of the amount available during the last half of 1947 mainly because all the wartime stock-accumulations found in the Far East have now been distributed.

A revised questionnaire, calling for final data for the second half of 1947 is being forwarded to representatives of the consuming countries. Replies are expected by March 1, 1948, to enable the Committee to recommend final allocations for the first half of 1948 later in that month.

The first interim allocations for 1948 are as follows:

Country	*Amount (long tons)*
Canada	1,090
Chile	32
Czechoslovakia	336
Denwark	160
Finland	60
France	2,720
Germany U. S./U. K. Zone	324
Germany French Zone	120
Hong Kong	100
India	1,400
New Zealand	146
Palestine	55
Poland	520
Switzerland	200
Turkey	140
United States	10,200
*Others	100
Total	17,703

*Latin America, other than Argentina, Brazil, Chile, Uruguay, and Mexico, and Middle East, other than Egypt, Palestine, Syria and Iran. These countries are normally provided for by individual allocations.

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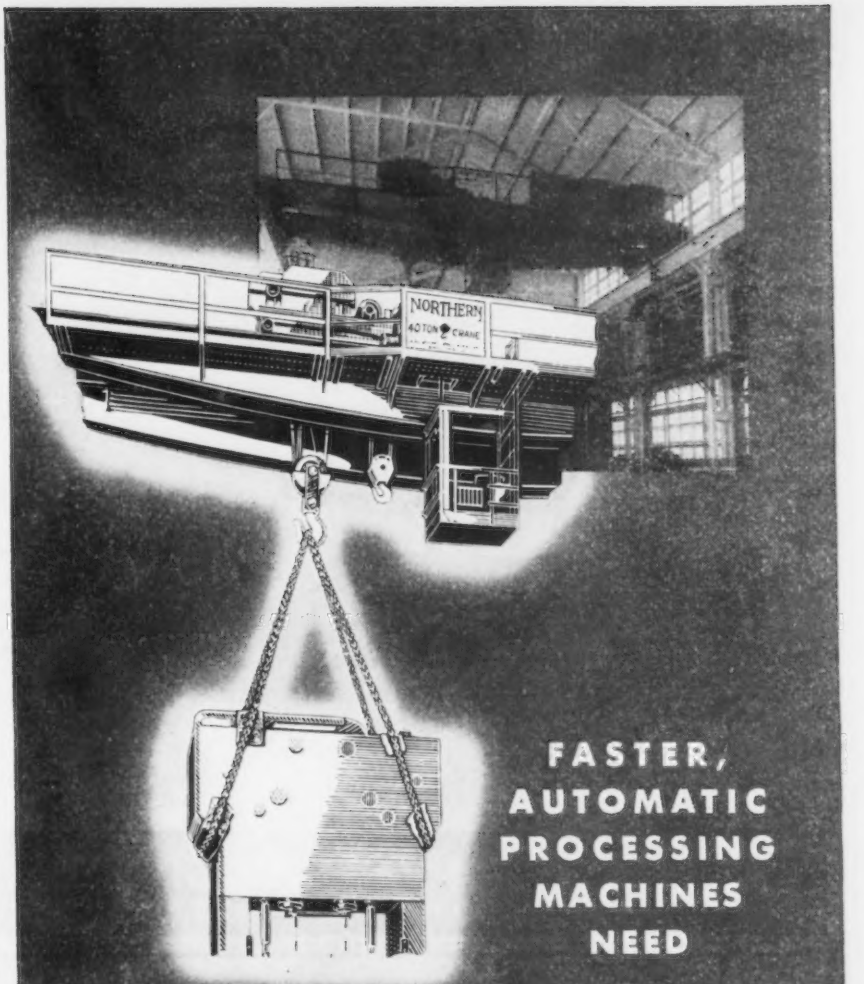

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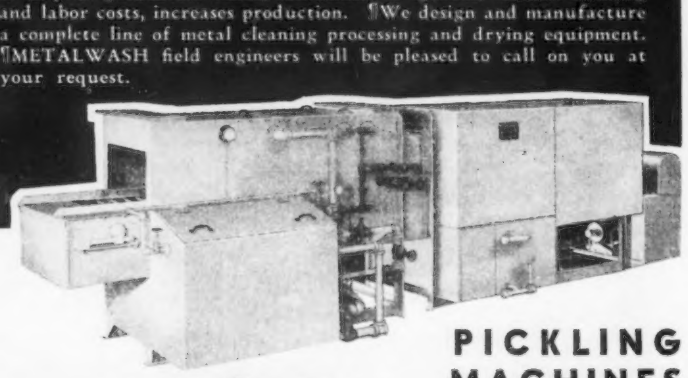

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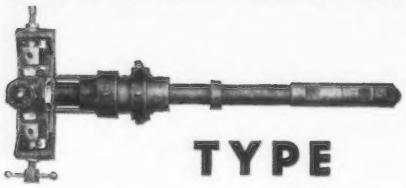

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HOSKINS MFG. CO., 4445 Lawton Ave., Detroit 8.

KAUKAUNA MACHINE CORP., Kaukauna, Wisc.

Knowles, F. S., 77 W. Washington St., Suite 1702, Chicago 2.

KOPPERS COMPANY, INC., Koppers Bldg., Pittsburgh 19.

LAKE CITY MALLEABLE CO., 5046 Lakeside Ave., Cleveland 14.

LEHIGH FOUNDRIES, INC., Easton, Pa.

MACKINTOSH HEMPHILL CO., 901 Binghamton St., Pittsburgh 3.

MICHIANA PRODUCTS CORP., Michigan City, Ind.

NATIONAL FOUNDRY CO., 2-40 Sanford Co., Brooklyn 5.

Oliver Machinery Co., 1025 Clancy St., Grand Rapids 2.

Penn Foundry Co., Box 112, Reading, Pa.

PEORIA MALLEABLE CASTINGS CO., Alexander & Averyole Sts., Peoria 1, Ill.

Ross-Meehan Foundries, P. O. Box 1258, Chattanooga 1, Tenn.

Stoody Co., 1149 W. Slauson Ave., Whittier, Calif.

Universal Foundry Co., Oshkosh, Wisc.

Wall-Colmonoy Corp., 714 Fisher Bldg., Detroit 2.

Western Foundry Co., 3634 S. Kedzie Ave., Chicago 32.

Wheland Co., Chattanooga, Tenn.

WOOD, R. D., CO., Conshohocken, Pa.

Youngstown Foundry & Machine Co., P. O. Box 539, Youngstown 1.

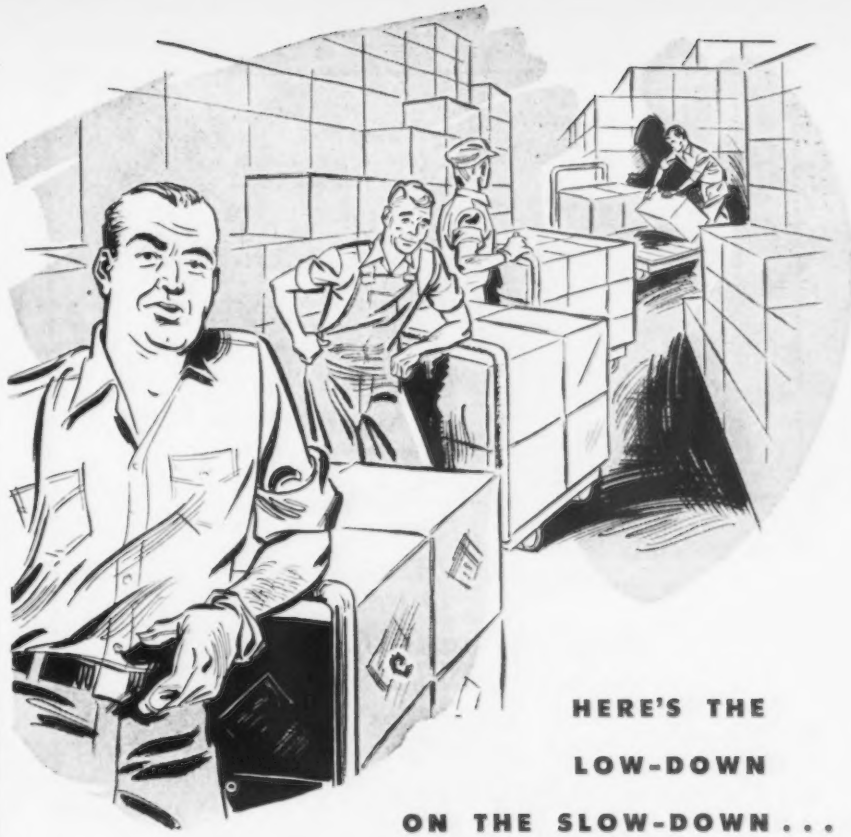
Castings, Alloy Steel

ALLEGHENY LUDLUM STEEL CORP., Forging & Casting Div., Ferndale 20, Mich.

Alloy Casting Co., Victor Ave., Champaign, Ill.

AMERICAN BRAKE SHOE CO., 230 Park Ave., New York 17.

AMERICAN MANGANESE STEEL DIV., American Brake Shoe Co., 375 E. 14th St., Chicago Heights, Ill.



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There's no mystery about it. It's just that men with loaded trucks simply can't move any faster in crowded aisles and on congested loading platforms. But it's a slow-down just the same . . . and a costly one.

There's no necessity for this expensive loss of time. Two men . . . one at each end of a Rapid-Wheel Gravity Conveyor line . . . can do the work of a dozen men with trucks. They'll keep goods moving smoothly . . . with little effort. If it is going upstairs, couple the line to a Floor-Veyor (an inclined power-belt conveyor). If it's to be stacked, hook on a Rapid-Power Booster. The job will be done in less time . . . for less money . . . with less manpower.

Remember . . . the cost of handling materials, parts, and products runs as high as 30% of total production costs. It's an item that deserves careful thought. We'll be glad to make an analysis of your operations and suggest the proper equipment. There's no obligation.

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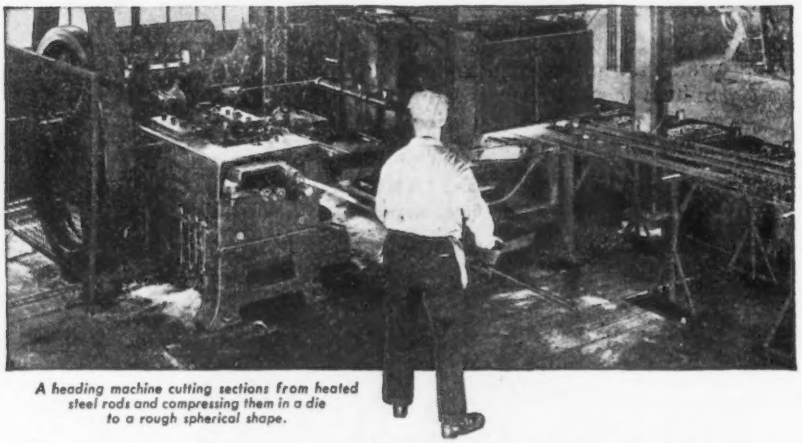

A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

The steel is carefully chosen and inspected, even before it gets to the heading machine. After being "born" here, balls are carefully "brought up," through a long series of grinding and lapping operations, to the unbelievably high standards of finish, sphericity and precision which have made Strom Metal Balls the standard of Industry. Strom Steel Ball Co., 1850 South 54th Avenue, Cicero 50, Illinois.

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Chain Belt Co., 1755 W. Bruce St., Milwaukee 4.

Chicago Steel Foundry Co., Kedzie Ave. & 37th St., Chicago 32.

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Eimco Corp., 636 S. 4th St., Salt Lake City 8.

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GISHOLT MACHINE CO., 1245 E. Washington Ave., Madison 3, Wis.

HAYNES STELLITE CO., 30 E. 42nd St., New York 17.

JESSOP STEEL CO., Washington, Pa.

Knowles, F. S., 77 W. Washington St., Chicago 2.

LEBANON STEEL FOUNDRY, Lebanon, Pa.

MACKINTOSH HEMPHILL CO., 901 Binghamton St., Pittsburgh 3.

Maynard Electric Steel Castings Co., 2856 S. 27th St., Milwaukee 7.

MICHIANA PRODUCTS CORP., Michigan City, Ind.

MIDVALE CO., Nicetown, Philadelphia 40.

NATIONAL ERIE CORP., Erie, Pa.

National Malleable & Steel Casting Co., Quincy & Baldwin Road, Cleveland.

Otis Elevator Co., 260 11th Ave., New York 1.

Pittsburgh Steel Foundry Corp., Glassport, Pa.

Ross-Meehan Foundries, P. O. Box 1258, Chattanooga, Tenn.

Sivyer Steel Castings Co., 1675 S. 43rd St., Milwaukee 14.

Sterling Alloys, Inc., Woburn, Mass.

Vulcan Iron Works, Wilkes-Barre, Pa.

Western Foundry Co., 3634 S. Kedzie Ave., Chicago 32.

Castings, Aluminum

Allison Div., General Motors Corp., Indianapolis 6.

ALUMINUM CO. OF AMERICA, Gulf Bldg., Pittsburgh.

AMERICAN BRAKE SHOE CO., 230 Park Ave., New York 17.

CADMAN, A. W., MFG. CO., 2850 Smallman St., Pittsburgh 22.

Central Pattern & Foundry Co., 3737 S. Sacramento Ave., Chicago 32.

Commerce Pattern Foundry & Machine Co., 7450 Melville at Green, Detroit 17.

ELECTRIC AUTO-LITE CO., Die Casting Div., Woodstock, Ill.

Gilhams, H. S., & Co., 2312 Lincoln-Liberty Bldg., Philadelphia 7.

Grinnell Company, Inc., 260 West Exchange St., Providence 1.

Judd, H. L., Co., Inc., 87 Chambers St., New York 7.

Knowles, F. S., 77 W. Washington St., Chicago 2.

Little Giant Co., 130 Rock St., Mankato, Minn.

National Electric Welding Machines Co., 1846-1860 N. Trumbull St., Bay City, Mich.

Otis Elevator Co., 260 11th Ave., New York 1.

Precision Castings Co. Inc., Fayetteville, Syracuse, N. Y.

REYNOLDS METAL CO., Reynolds Bldg., Richmond 19, Va.

Textile Machine Works, Reading, Pa.

Universal Foundry Co., Oshkosh, Wisc.

Western Foundry Co., 3634 S. Kedzie Ave., Chicago 32.

Wood, J. R., Products Corp., 70 Washington St., Brooklyn 1.

Castings, Beryllium Copper

AMPCO METAL, INC., 1745 So. 38th St., Milwaukee.

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.

Commerce Pattern Foundry & Machine Co., 7450 Melville at Green, Detroit 17.

Gilhams, H. S., & Co., 2312 Lincoln-Liberty Bldg., Philadelphia 7.

Weiger Weed & Co., 11644 Cloverdale Ave., Detroit 4.

Wood, J. R., Products Corp., 70 Washington St., Brooklyn 1.

Castings, Brass, Bronze, Copper

AMERICAN BRAKE SHOE CO., 230 Park Ave., New York 17.

American Car & Foundry Co., 30 Church St., New York 8.

American Non-Gran Bronze Co., Berwyn, Pa.

AMPCO METAL, INC., 1745 So. 38th St., Milwaukee.

Arcade Manufacturing Div., Freeport, Ill.

Aurora Metal Co., 614 West Park Ave., Aurora, Ill.

BETHLEHEM STEEL CO., Bethlehem, Pa.

Commerce Pattern Foundry & Machine Co., 7450 Melville at Green, Detroit 17.

Condenser Service & Engineering Co. Inc., 95 River Street Hoboken N. J.

Gilhams, H. S., & Co., 2312 Lincoln Liberty Bldg., Philadelphia 7.

Grinnell Company, Inc., 260 West Exchange St., Providence 1.

JEFFREY MFG. CO., 925 No. 4th St., Columbus 16.

(TO BE CONTINUED)

X-Ray Gaging of Sheet And Strip Thickness

(CONTINUED FROM PAGE 69)

multiplier readings, indicating positive or negative variance from the standard, to an instrument in view of the operator. An intermediate circuit, whose sensitivity is adjustable, can automatically actuate relays to operate units for rejecting off gage material in flying shear applications similar to the Jones & Laughlin installation shown in fig. 2, or to control the screwdowns and thereby maintain uniform thickness in material coming from a mill.

A discussion of additional phases of X-ray gaging is available in "Continuous Gaging With X-Ray Micrometer," THE IRON AGE, Nov. 29, 1945, p. 50.—Ed.

The instruments now in use are designed for thickness of sheet from 0.005 to 0.050 in., but the same basic equipment can be adapted to handle material up to 0.125 in. without involving unreasonable power availability or danger from X-ray radiation. A sensitivity of 1 pct can be maintained, which means that if 0.010-in. steel is standard, the gage will indicate a full scale deflection for a deviation of 0.0001 in. from standard, or will show a readable change if the test material is 0.00001 in. off. Less drastic standards can, of course, be applied by a simple adjustment.

The X-ray source emit radiation out of phase so that their rays alternate 60 times per sec on a 120-cycle line. This means that thickness measurements on the material being rolled are made every 1/60th sec. From the mill speed the extent of gaging can be calculated. For example on the ultra high speed mills for tinplate stock, with the strip moving at 5000 ft per min and with 3600 thickness measurements per min, the material would be gaged approximately every 16.6 in. On slower mills a much shorter distance between gagings is obviously possible.

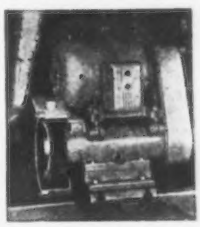
On the instruments in use there is no danger from X-ray exposure as tests have proved that an operator could stay within 5 in. of the actual penetrating beam for 8 hr a day without incurring injury. If instruments for thicker metal sheets are built they will require correspondingly more powerful X-ray sources and may necessitate additional exposure guards, but instruments capable of measuring 0.125-in. steel are thought practicable without undue danger or necessity for shielding.

One of the gages is now in operation in a copper mill where it is installed between a reduction mill and its takeup mandrel to operate an automatic control of the screwdowns. The gage is mounted on a sliding truck and scans the strip laterally. Another installation is measuring the wall thickness of glass bottles.

Publisher requires accuracy first.

ROLL GRINDING LATHE KEEPS PRESSES ROLLING

Keeping a battery of high speed presses running day after day requires efficient rubber roll maintenance. At Crowell-Collier Publishing Co., Springfield, Ohio, this important work is done by a highly developed main press roll department.



5-hp Grinding Unit

Included among the special purpose machine tools in this department is a brand new 25" LeBlond heavy duty roll grinding lathe which will accommodate rolls up to 13" in diameter 120" in length.

This lathe is equipped with a heavy duty 5-hp grinding unit designed by LeBlond, a special revolving spindle tailstock, and two steel-body chucks.

Although the publisher insists on quality first and speed second, it is believed the new 25" LeBlond lathe will provide both essentials in good measure.

Designed primarily as a rubber roll grinding machine, the 25" LeBlond Lathe is readily adaptable to standard metal working operations.

A Regal roll polishing machine, a light pattern lathe for smaller rolls, is also manufactured by LeBlond, and is equipped with a 2-hp grinder. For complete information, write Roll Grinding Dept., The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.

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MACHINE TOOLS

. . . News and Market Activities

$300 Million Year Forecast by Some in Machine Tool Industry

• • • **Machine tool** shipments in December, as reported to National Machine Tool Builders' Assn., totaled $25,697,243; unfilled orders stood at $105,626,509 at the end of the month, and estimated industry shipments were $28,873,000, the association reported.

A few prognosticators are already on record that 1948 will be a $300 million year for the machine tool industry, despite the fact that on Jan. 1, 1947, unfilled orders totaled $154,759,996, some $50 million higher than the backlog on Jan. 1, 1948. Prices were materially increased during 1947, and are now being raised again.

However Unfilled Orders Are $50 Million Less Than At Close of 1946

o o o

In Chicago, business has been very quiet in all lines so far for the month of January. Machine tool dealers report the orders are still coming in but not in the expected volume, as they had anticipated a big pickup after the first of the year. Inquiries remain strong in practically ali lines. Since the first of January, one large machinery dealer reports the makers have increased the prices of many different types of tools and the price increase on the average has been 7½ pct. The types of machinery on which the prices were increased included vertical turret lathes, planers, horizontal boring, milling and drilling machines, shapers and gear cutters, pipe threading machines, grinders and drills.

One machinery maker who had been trying to absorb the recent increases in steel castings was forced to increase the price of tools 5 pct. Another large machinery dealer reports that 10 out of 27 firms whose machinery he sells carry escalator clauses in the contracts. The balance of these makers are still holding firm prices on everything but electrical controls. Electrical controls for the most part are sold with the understanding that the price at time of shipment will be enforced.

1947 Machine Tool Business Summary

1947	*Shipments*	*Unfilled Orders*	*Estimated Industry Total From Shipments Reported*
Jan.	$24,153,612	$154,759,996	$26,542,000
Feb.	24,356,004	146,144,785	26,765,000
Mar.	26,400,741	137,174,696	29,012,000
Apr.	24,439,504	128,830,210	26,857,000
May	23,211,626	121,154,746	25,791,000
June	21,944,699	120,268,031	24,383,000
July	16,842,587	124,154,946	18,924,000
Aug.	16,482,635	122,853,741	18,520,000
Sept.	19,833,294	118,109,224	22,285,000
Oct.	24,513,104	113,674,009	27,545,000
Nov.	21,863,621	110,645,813	24,566,000
Dec.	25,697,243	105,626,509	28,873,000

Delivery of machine tools has shown a marked improvement in practically all lines since the Machine Tool show. A moderate sized tool company in Cincinnati until November was quoting 3 to 3½ months' delivery on radials and this same company can now deliver in 4 weeks. Uprights from this company carried a 16 to 20 weeks' promise in November but are now obtainable in 2 weeks. The machinery dealers report that orders for this type of equipment have not fallen off and they have come to the conclusion that increased production by the tool builders is the reason delivery has improved.

A seller of milling machines stated that delivery back in November was 2 months whereas now the same machines from the same company can be had in a month. On the whole the industry in Chicago is expecting increased volume orders in the very near future. Just why they haven't materialized to date is not clear except that some observers believe machinery buyers may be awaiting a better clarification on corporate taxes before sinking a lot of money into new equipment and installations.

In Detroit, the optimism reported by some segments of the industry a week ago is continuing. While no new ordering has been reported, the volume of inquiries, particularly from small shops, is continuing.

A check of motor company machine tool buyers indicates that the policy of insisting on dual suppliers is being maintained almost without exception. It has also been disclosed that increasing emphasis is being placed on interchangeability features of new machines.

Information currently available indicates that the total volume of new tooling for the Chrysler line of cars will aggregate about $60 million. There are no indications that a new engine is involved, hence the total sum will be expended to restyle the fourth line of Chrysler cars. Some releases on this program have already been made, it is reported, and present indications point to a release within the next few weeks of the remainder of the Chrysler tooling program.

Some special tooling has been released for the new Olds engine program and further placements are expectd in the near future.

The new Buick "dynaflow" transmission is already in production for the Roadmaster series. However, additional machines will be required if the remaining two lines of Buick are to be equipped with torque converters. Some tooling orders for this purpose may be forthcoming from Flint in the next few months.

MORE STEEL COMING FOR DSC CUSTOMERS

NEW MILL FOR DETROIT STEEL CORPORATION

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Here's How We're Going to Have More Steel for You . . . .

Dependable Dan Our Customers' Man Invites Correspondence Regarding Your Normal and Regular Requirements

Frankly, we may be unable to accept new business now, but looking ahead, we would like to keep you informed about our expanding facilities.

Now under construction . . . a big, new cold rolled strip mill in New Haven, Conn., scheduled to begin rolling by October 1, 1948 . . . to give Eastern customers 60,000 tons additional producing capacity . . . practically at their stockroom doors.

Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

And D.S.C. Reminds You . . . .

That our Detroit mill . . . our Reliance Division network and our Craine-Schrage Steel Division will continue to do everything possible to keep your production rolling . . giving every account equitable consideration . . . constantly planning and working toward greater production and supply . . . and towards higher standards of steel service.

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Products: SHEETS—Hot Rolled . . . Hot Rolled Pickled . . . Cold Rolled . . . Long Terne . . . Galvanized; PLATES; COLD ROLLED STRIP STEEL—Coils and Cut Lengths . . . Slit or Round Edge . . . All Tempers.

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Warehouse and General Office: 8701 Epworth Blvd., Detroit 4, Mich.
Sales Offices: Grand Rapids, Toledo, Indianapolis
Products: Cold Drawn and Hot Rolled Carbon and Alloy Steel Bars . . . Tool Steels . . . Drill Rod . . . Wire Rope, etc.

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NONFERROUS METALS

. . . News and Market Activities

Copper

• • • **Consumers of copper** continue actively seeking tonnages from producers who have been unable to meet the full requirements of wire mills, brass mills, or export demand. Export tonnage being accepted by major producers is declining relative to total export tonnage as indicated by the gradually increasing weighted export copper price. Copper producers are reluctant to see the average export price increase as, if carried far enough, it could be the factor responsible for forcing up the domestic copper price.

Some market observers foresee a gradual improvement of the copper supply available to domestic consumers with increased imports during the year. Canadian copper producers have already indicated that additional tonnage may be expected from Canada during 1948. There is also the possibility of increasing imports of Chile copper. Kennecott's copper is fire refined and therefore not as suitable for rolling as electrolytic. Whether additional South American copper could be made available to domestic consumers depends in large part on the availability of United States funds to domestic consumers. It is certain that the working out of the Marshall Plan can be expected to release dollars to permit foreign copper purchases, according to producers, but it may also be a factor in stimulating additional mining abroad which would result in a more ample supply for the domestic market.

Producers are studying the details of the new export regulations to determine whether exports of foreign copper refined in the United States would be subject to closer export control than formerly.

Zinc

• • • **The price of slab** zinc was increased 1½¢ per lb last week lead by the American Zinc, Lead & Smelting Co. on Jan. 21 and quickly followed by other producers. The basis for the increase was a $6 higher settlement price for Joplin concentrates to a price of $78 per ton announced by the Eagle-Picher Lead and Smelting Co. on the day before. For some weeks market factors have been anticipating a rise in the Tri-state concentrate price which would immediately be reflected in the price of slab zinc. However all factors in the Joplin market deferred taking the first step in a zinc price increase while attempting to take advantage of a possible increase by basing their contracts on the average monthly price. The current price of Prime Western is 12.00¢ per lb, East St. Louis, 12.61¢ delivered New York.

The zinc market continues active and all grades are in heavy demand. Zinc consumers are hard pressed to obtain their requirements in Prime Western, Special High Grade and High Grade. There is nothing on the horizon at this time which would indicate the possibility of subsequent improved supplies of these grades according to market observers.

•

Lead

• • • **Pressure** for deliveries of lead continues high but producers are convinced that consumers are obtaining enough lead to continue operations. Additional tonnages covered by current orders above deliverable tonnages are believed by producers to be the result of a desired margin of safety. The increase in the price of zinc has not had any effect on the price of lead. The normal prewar price relationship between lead and zinc with lead always at the lower level has been reversed by the postwar shortness of lead compared with requirements. Although there is always the possibility of the pressure of mounting cost increasing the price of lead, producers do not anticipate any immediate increase. However, it can be expected that the present market position of the metal should continue its price above that of zinc.

•

Drop Red Metal Prices

New York

• • • **Refineries and ingot** producers reduced their scrap buying prices for copper and brass items last week as the result of the larger tonnages coming into their plants at recent increased scrap prices. Price decreases on copper and composition items were reduced ½¢ per lb by refineries and ½¢ to ¾¢ by ingot producers. Brass items were reduced only ¼¢, reflecting the higher price of zinc which also served to raise the prices of zinc scrap by ½¢ per lb. Other scrap metals remained unchanged.

•

Aluminum, Zinc Advances

Toronto

• • • **Following the advance** in U.S. prices, Canadian prices of zinc were moved up on Jan. 21. The increase in Canada had to follow the upward movement across the line, otherwise this market would be drained of supply. Prime Western zinc advanced from 10.75¢ to 11.75¢; High Grade from 11.00¢ to 12.50¢ and Special High Grade from 11.50¢ to 12.75¢.

Announcement also was made by Aluminum Co. of Canada Ltd., Montreal, that effective Jan. 19, the price of Alcan aluminum ingots were advanced 1¢ per lb to 15¢. This new price is for delivery in Canada or f.a.s. Canadian port for export.

Nonferrous Metals Prices

Cents per pound

	Jan. 21	Jan. 22	Jan. 23	Jan. 24	Jan. 26	Jan. 27
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	94.00	94.00	94.00	94.00	94.00	94.00
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$80 to $82
Nickel, electro, f.o.b. New York	36.56¢
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz	$66 to $69
Silver, New York, cents per oz	74.625
Tin, Grade A, New York	94.00
Zinc, East St. Louis	12.00
Zinc, New York	12.61
Zirconium copper, 6 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.75-20.50
No. 120	19.25-20.00
No. 123	18.75-19.50
80-10-10 ingot	
No. 305	25.50
No. 315	23.00
88-10-2 ingot	
No. 210	31.00
No. 215	29.00
No. 245	23.75
Yellow ingot	
No. 405	15.75-17.00
Manganese Bronze	
No. 421	19.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	16.50-17.25
0.60 copper, max.	16.50-17.00
Piston alloys (No. 122 type)	14.00-16.50
No. 12 alum. (No. 2 grade)	15.50-16.00
108 alloy	16.00-16.25
195 alloy	14.00-16.50
AXS-679	16.50
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-95½ pct	15.25-16.00
Grade 2—92 pct-95 pct	14.00-15.00
Grade 3—90 pct-92 pct	13.50-14.50
Grade 4—85 pct-90 pct	13.25-14.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	18¾
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drub	44.50
Copper sulfate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls. frt. allowed	14.50
Silver cyanide, 100 oz lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 200 lb drums	16.00
Zinc cyanide, 100 lb drums	35.50
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall; 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75-S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness; 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢, 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in. 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Round Rod: M, diam, in., ¼ to ⅜, 47¢; ½ to ¾, 45¢; 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ⅜, $1.12; ⅜ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, lcl.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

Cents per pound, freight prepaid on 200 lb.

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Yellow brass rod turnings	14¼¢
Leaded yellow brass turnings	14¼¢
Loose yellow brass trimmings	15¼¢

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16½—17
No. 2 heavy copper and wire	15½—16
Light copper	14 —14½
Auto radiators (unsweated)	9¾—10¼
No. 1 composition	12¼—12¾
No. 1 composition turnings	11¾—12¼
Clean red car boxes	10 —10½
Cocks and faucets	10 —10¼
Mixed heavy yellow brass	7¾— 8¼
Old rolled brass	8¼— 8¾
Brass Pipe	9¾—10
New soft brass clippings	11¾—12¼
Brass rod ends	10¼—10¾
No. 1 brass rod turnings	9¾—10¼

Aluminum

Alum. pistons with struts	4½— 5
Aluminum crankcases	6½— 7
2S aluminum clippings	9 — 9½
Old sheet & utensils	7 — 7½
Mixed borings and turnings	— 2
Misc. cast aluminum	6½— 7
Dural clips (24S)	6 — 6½

Zinc

New zinc clippings	7 — 7½
Old zinc	5 — 5½
Zinc routings	3 — 3½
Old die cast scrap	3 — 3½

Nickel and Monel

Pure nickel clippings	16 —17
Clean nickel turnings	12½—13
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½— 7

Lead

Soft scrap lead	12 —12½
Battery plates (dry)	7 — 7½

Magnesium Alloys

Segregated solids	7½— 8
Castings	4½— 5½

Miscellaneous

Block tin	75 —77
No. 1 pewter	60 —62
No. 1 auto babbitt	45 —47
Mixed common babbitt	13½—14
Solder joints	16½—17
Siphon tops	45 —47
Small foundry type	16 —16½
Monotype	15 —15½
Lino. and stereotype	14 —14½
Electrotype	11½—12
New type shell cuttings	14½—15
Clean hand picked type shells	6½— 7
Lino and stereo dross	6½— 7
Electro dross	4½— 5

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

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TOP SCRAP IN SPORTS

TOP SCRAP IN METALS

Schlossberg

PROMPT DEPENDABLE SERVICE

ALL GRADES • FERROUS AND NON FERROUS

IN VIEW OF THE CHANGES IN CONSUMPTION AND PRODUCTION OF ELECTRIC FURNACE SCRAP — CHECK WITH US AS TO THE PHYSICAL PROPRIETY AND ANALYSIS OF THE VARIOUS GRADES WE BUY AND SELL FOR SUCH USE.

MAX SCHLOSSBERG COMPANY • 33 NORTH LA SALLE STREET • CHICAGO, ILLINOIS • FRANKLIN 0380

SCRAP

. . . News and Market Activities

Little Action Seen As Mills Hold to Formula

New York

• • • It looks as though the steel mills have won another round in their battle to keep scrap prices down. There has been little or no action once again—a condition that always happens after mills have been in and out. Furthermore there are signs that scrap consumers feel cocky enough to attempt to drive prices down in the weeks to come instead of being satisfied with a static market at present levels. The attempts to do so may cost some steel production.

Evidence that some mills will not pay any higher prices to keep openhearths going was seen. Just how far such mills will go on that basis remains to be seen. Just as scrap users step out some times and pay more than prevailing prices, so some steel makers will refuse to take off furnaces in order to influence the price of scrap.

At any rate the market this week is comparatively listless. It has little spirit left after the shellacking it has taken at the hands of the buyers. All business seems to be on the basis of open orders on which deliveries are being made, but with reluctance. Once again buyers will probably stay on the sidelines and see what happens over the next few weeks.

Some markets for the first time in weeks showed soft spots in the cast grades. Prices have reached a levelling off of sorts, but the foundries seem comparatively comfortable and contented.

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PITTSBURGH—No price changes were chalked up during the past week for either iron or steel scrap. Some selling interests hint of a strong undertone to the market because of the weather. But they may be disappointed if the cold cuts into ingot operations as it did finishing mills early this week. Freezing of the Ohio as far south as Cairo, Ill. cut off scrap shipments by barge from river points. Receipts of material at district mills were up last week over the previous week so the full effect of zero weather on transportation and yard activity can't be measured for another week. Early this week a substantial number of finishing mills were out of operation due to the natural gas shortage. The extent to which this will effect ingot operations or scrap needs could not be determined at mid-week.

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CHICAGO — Dealers have shipped heavily to all foundries on the recent high prices and it appears that some foundries are getting more comfortable on scrap which may cause the high priced railroad specialties to taper off in the next few weeks. Mill inventories on openhearth scrap continue to cause worry as most mills are operating on a very slender inventory margin. About the only change in the market last week was that the bottom dropped out of the rerolling rail market. At least three separate purchases were made at $55 and the users of this item at the the moment refuse to pay more. So far the miscellaneous rail and short rails have not reacted. Foundries are still buying at the high figures although for the first time in months the steel items for foundries appear soft.

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CLEVELAND—Whether the result of the Institute convention last week in Chicago, or the fact that some dealers' yards are pretty well loaded with material, there is a feeling in the trade this week that the mills are going to win the formula fight, if they can hold out for another three or four weeks. In the first place, the market looks a little bit softer with all major openhearth operators holding the price line, according to trade sources. As a result, some of the electric furnaces and other specialty buyers are reducing their prices, and finally, the openhearth operators are putting the pressure where it counts. Some observers believe a lot of scrap would have moved here and in the Valley this week had it not been for the heavy snow. Perhaps most important of all is the fact that brokers are finding it a little easier to buy.

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DETROIT—Odds favoring survival of the so-called scrap formula in Detroit were increased this week when large mills again resisted pressures to make them buy at more-than-formula prices. Reports that small tonnages were being bought by outsiders paying higher prices were more than offset by indications that ingot producers may find it more difficult in the future to pay more than the formula for desired tonnages. Meanwhile, some easing on the price of cast grades is reported with four large buyers in this area temporarily withdrawing from the market. The undertone of the cast market, however, continues strong.

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PHILADELPHIA—Weakness appeared in the heavy melting market here last week with the continued absence of the mills from the market and the absence of additional No. 1 heavy melting orders at $46. Mill inventories of scrap have been improved during the last few weeks because of the absence from the market of a major consumer. A shipload of 7000 tons of heavy melting scrap came in from the Pacific during the week for Lukens Steel Co. Weather conditions are not favorable for scrap collection and preparation; nevertheless the market pressure is definitely easier and No. 2 heavy melting is quoted in the range of $40.50 to $41.50, No. 1 and No. 1 bundles at $42 to $43.

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BOSTON—Plenty of snow, ice, freezing weather and idle shop talk, but no scrap, no cars and trucks, no business. That's the market picture today. Mills and brokers talk $31.90 f.o.b. for heavy melting steel. Yards say nothing; some do not bother to answer the phone. The "I could sell it if I could get it" fellows talk as high as $36.50, quickly adding, "But that's not the market."

•

NEW YORK—The addition of more snow on top of what was left from earlier storms had yards in bad shape again early this week. Almost no scrap was moving, and brokers were reluctant to bid for material. After a flurry of price activity late last week to fill orders for small eastern Pennsylvania consumers, prices dropped back to formula levels. Cast grades made still another upward cycle, this time of a more selective nature.

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BUFFALO — Mills appear to have won at least a temporary victory in their battle to keep scrap prices down. All the leading local dealers have open orders at the formula, but cold and snow restricted yard operations and movement was limited to railroad and factory scrap. Turnings were strong with both shoveling and machine shop items advancing $2. Cast grades were scarce and unchanged in price.

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ST. LOUIS—Near zero weather had the effect of further slowing up the movement of scrap to this market. Mills are said to be getting some scrap at the prices they are willing to pay, but not as much as they'd like to have. The demand for foundry grades continues strong.

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BIRMINGHAM — Mills in this area have yet to show any sign of weakening in the tug of war over prices for openhearth and blast furnace material. Despite freezing temperatures, ice and snow, openhearth shipments for the past several days are reported to be the heaviest in several months. Terrific demand for cast has resulted in as much as $65 per ton being paid for No. 1 cupola cast.

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TORONTO—With domestic purchased scrap taking care of less than 25 pct of consumer requirements, the Canadian scrap supply situation is becoming more critical. Dealers see no chance of improvement before next spring when there is an opportunity to pick up materials from the rural districts. Practically all scrap now reaching the market is from industrial plants, and supplies from this source are below normal due to the shortage of finished steel preventing full production schedules. In iron grades the shortage is more acute than in steel lines and as a result many foundries, unable to get scrap, have swung almost exclusively to pig iron for melting purposes.

UNIVERSITY OF MICHIGAN LIBRARIES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.50
RR. hvy. melting	$41.00 to 41.50
No. 2 hvy. melting	40.50
RR. scrap rails	53.00 to 54.00
Rails 2 ft and under	57.00 to 58.00
No. 1 comp'd bundles	40.50
Hand bdld. new shts.	40.50
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	38.00 to 38.50
Mixed bor. and turn.	37.00 to 37.50
Cast iron borings	37.00 to 37.50
No. 1 cupola cast.	56.50 to 57.00
Hvy. breakable cast.	43.00 to 44.00
Malleable	65.00 to 67.00
RR. knuck. and coup.	53.50 to 54.50
RR. coil springs	53.50 to 54.50
RR. leaf springs	53.50 to 54.50
Rolled steel wheels	53.50 to 54.50
Low phos.	47.00 to 48.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50
No. 2 hvy. melting	39.50
No. 1 bundles	39.50
No. 2 dealers' bundles	39.50
Bundled mach. shop turn.	39.50
Galv. bundles	37.50
Mach. shop turn.	$34.00 to 34.50
Short shov. turn.	36.50 to 38.00
Cast iron borings	35.00 to 35.50
Mix. borings & turn.	34.00 to 34.50
Low phos. hvy. forge	50.00 to 55.00
Low phos. plates	45.00 to 47.00
No. 1 RR. hvy. melt.	41.75 to 42.00
Rerolling rails	54.50 to 55.00
Miscellaneous rails	57.00 to 58.00
Angles & splice bars	60.00 to 61.00
Locomotive tires, cut	57.00 to 58.00
Cut bolster & side frames	52.00 to 54.00
Standard stl. car axles	62.00 to 64.00
No. 3 steel wheels	56.00 to 57.00
Couplers & knuckles	60.00 to 61.00
Rails 2 ft and under	64.00 to 65.00
Malleable	75.00 to 76.00
No. 1 mach. cast.	69.00 to 70.00
No. 1 agricul. cast.	62.00 to 63.00
Heavy breakable cast.	55.00 to 60.00
RR. grate bars	60.00 to 63.00
Cast iron brake shoes	60.00 to 61.00
Cast iron carwheels	58.00 to 60.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
No. 1 bundles	39.50 to 40.00
No. 2 bundles	39.50 to 40.00
Mach. shop turn.	33.50 to 34.00
Shoveling turn.	35.50 to 36.00
Cast iron borings	32.50 to 33.00
Mixed bor. & turn.	34.50 to 35.00
Low phos. plate	52.50 to 54.00
No. 1 cupola cast	61.00 to 63.00
Hvy. breakable cast	55.00 to 58.00
Rails 18 in. & under	61.00 to 65.00
Rails random length	55.00 to 59.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	$33.00 to $35.00
No. 2 hvy. melting	31.90
Nos. 1 and 2 bundles	31.90
Busheling	31.90
Shoveling turn.	30.00 to 31.00
Machine shop turn.	28.50 to 29.50
Mixed bor. & turn.	28.50 to 29.50
Cl'n cast. chem. bor.	34.00
No. 1 machinery cast.	50.00 to 55.00
No. 2 machinery cast.	50.00 to 55.00
Heavy breakable cast.	47.00 to 50.00
Stove plate	45.00 to 50.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	$35.50
No. 2 hvy. melting	35.50
No. 1 bundles	35.50
New busheling	35.50
Flashings	35.50
Mach. shop turn.	$30.00 to 30.50
Shoveling turn.	31.00 to 31.50
Cast iron borings	31.00 to 31.50
Mixed bor. & turn.	31.00 to 31.50
Low phos. plate	41.00 to 42.00
No. 1 cupola cast	55.00 to 60.00
Heavy breakable cast.	49.00 to 54.00
Stove plate	52.00 to 54.00
Automotive cast	55.00 to 60.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	40.50 to 41.50
No. 1 bundles	42.00 to 43.00
No. 2 bundles	40.50 to 41.50
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	36.00 to 36.50
Mixed bor. & turn.	35.00 to 35.50
Clean cast chemical bor.	40.00 to 42.00
No. 1 machinery cast.	58.00 to 60.00
No. 1 mixed yard cast.	56.00 to 57.00
Hvy. breakable cast.	54.00 to 55.00
Clean auto cast.	56.00 to 57.00
Hvy. axle forge turn.	43.50 to 44.50
Low phos. plate	47.00 to 48.00
Low phos. punchings	47.00 to 48.00
Low phos. bundles	46.00 to 47.00
RR. steel wheels	51.00 to 52.00
RR. coil springs	51.00 to 52.00
RR. malleable	70.00 to 75.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
Bundled sheets	37.50 to 38.50
Mach. shop turn.	33.00 to 33.50
Locomotive tires, uncut	50.00 to 52.00
Mis. std. sec. rails	53.00 to 54.00
Rerolling rails	54.00 to 55.00
Steel angle bars	57.00 to 58.00
Rails 3 ft and under	60.00 to 61.00
RR. steel springs	52.00 to 53.00
Steel car axles	55.00 to 56.00
Grate bars	56.00 to 57.00
Brake shoes	55.00 to 56.00
Malleable	71.00 to 72.00
Cast iron car wheels	56.00 to 57.00
No. 1 machinery cast.	66.00 to 67.00
Hvy. breakable cast.	54.00 to 55.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	37.50 to 38.50
No. 2 bundles	37.50 to 38.50
No. 1 busheling	37.50 to 38.50
Long turnings	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	60.00 to 65.00
Stove plate	55.00 to 58.00
No. 1 RR. hvy. melt.	37.50 to 38.50
Steel axles	38.00 to 39.00
Scrap rails	44.00 to 45.00
Rerolling rails	52.00 to 54.00
Angles & splice bars	47.50 to 50.00
Rails 3 ft. & under	52.00 to 56.00
Cast iron carwheels	48.00 to 50.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
No. 2 hvy. melting	40.00 to 40.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	36.00 to 36.50
Cast iron borings	36.00 to 36.50
Low phos.	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.50
No. 2 hvy. melting	34.50
No. 2 bundles	34.50
Comp. galv. bundles	$32.00 to 33.00
Mach. shop turn.	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Shoveling turn.	30.00 to 31.00
No. 1 cupola cast	53.00 to 55.00
Clean auto cast	53.00 to 55.00
Hvy. breakable cast	50.00 to 52.00
Charging box cast	50.00 to 52.00
Stove plate	50.00 to 51.00
Unstrp. motor blks.	49.00 to 50.00
Cl'n chem. cast bor.	33.50 to 34.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	39.75
No. 1 bundles	39.75
No. 2 bundles	39.75
No. 1 busheling	42.00 to 43.00
Mach. shop turn.	36.00 to 37.00
Shoveling turn.	38.00 to 39.00
Cast iron borings	33.00 to 34.00
Mixed bor. & turn.	33.00 to 34.00
Mixed cupola cast	53.00 to 55.00
Charging box cast.	48.00 to 50.00
Stove plate	52.00 to 54.00
Clean auto cast.	58.00 to 60.00
RR. malleable	70.00 to 75.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	46.00 to 49.00
Scrap rails	58.00 to 59.00
Rails 3 ft & under	60.00 to 61.00
RR. steel wheels	48.00 to 50.00
Cast iron carwheels	48.00 to 50.00
RR. coil & leaf spgs.	48.00 to 50.00
RR. knuckles & coup	48.00 to 50.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
No. 1 bundles	39.50 to 40.00
No. 1 busheling	39.50 to 40.00
Drop forge flashings	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Shoveling turn.	36.50 to 37.00
Steel axle turn.	39.50 to 40.00
Cast iron borings	35.50 to 36.00
Mixed bor. & turn.	34.50 to 35.00
Low phos.	44.50 to 45.00
No. 1 machinery cast.	60.00 to 65.00
Malleable	70.00 to 72.00
RR. cast.	63.00 to 65.00
Railroad grate bars	57.50 to 58.00
Stove plate	57.50 to 58.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft & under	57.00 to 61.00
Rails 18 in. & under	57.00 to 61.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	25.00
No. 2 bales	25.00

Per gross ton delivered to consumer:

No. 3 bales	$19.50
Mach. shop turn.	16.00
Elec. furn. 1 ft und.	$32.00 to 34.00
No. 1 cupola cast.	32.00 to 33.00
RR. hvy. melting	26.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$25.50
No. 2 hvy. melting	25.50
No. 1 bales	25.50
No. 2 bales	25.50
No. 3 bales	19.50
Mach. shop turn.	17.50
No. 1 cupola cast.	$36.00 to 40.00
RR. hvy. melting	26.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$25.50 to $26.50
Elec. furn. 1 ft and und.	27.50 to 30.00
No. 1 cupola cast.	27.50
RR. hvy. melting	25.00 to 26.00

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point.

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact, prep'd	21.00*
Bushelings, new fact, unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast	$42.00 to 43.00
No. 2 cast	35.00 to 37.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-rolled Steel: (cents per pound)	Jan. 27, 1948	Jan. 20, 1948	Dec. 30, 1947	Jan. 28, 1947
Hot-rolled sheets	2.80	2.80	2.80	2.50
Cold-rolled sheets	3.55	3.55	3.55	3.20
Galvanized sheets (10 ga.)	3.95	3.95	3.95	3.55
Hot-rolled strip	2.80	2.80	2.80	2.50
Cold-rolled strip	3.55	3.55	3.55	3.20
Plates	2.95	2.95	2.95	2.65
Plates wrought iron	6.85	6.85	6.85	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.30
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$6.80	$6.80	$5.75	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	5.05	5.05
Special coated mfg. ternes	5.90	5.90	4.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.60
Cold-finished bars	3.55	3.55	3.55	3.20
Alloy bars	3.30	3.30	3.30	3.05
Structural shapes	2.80	2.80	2.80	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	7.15	6.15
Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.30
Wire nails	4.75	4.75	4.25	3.75
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$2.50
Light rails	3.10	3.10	3.10	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00	$45.00	$45.00	$42.00
Slabs, rerolling	45.00	45.00	45.00	42.00
Forging Billets	55.00	55.00	55.00	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.55
Skelp	2.60	2.60	2.60	2.35

Pig Iron: (per gross ton)	Jan. 27, 1948	Jan. 20, 1948	Dec. 30, 1947	Jan. 28, 1947
No. 2, foundry, Phila.	$44.61	$44.61	$42.98	$32.51
No. 2, Valley furnace	39.50	39.50	37.50	30.50
No. 2, Southern Cin'ti	43.28	43.28	39.74	31.75
No. 2, Birmingham	37.38	37.38	34.38	26.88
No. 2, foundry, Chicago†	39.00	39.00	38.00	30.50
Basic del'd Philadelphia	44.11	44.11	42.48	31.93
Basic, Valley furnace	39.00	39.00	37.00	30.00
Malleable, Chicago†	39.50	39.50	38.50	30.50
Malleable, Valley	39.50	39.50	37.50	30.50
Charcoal, Chicago	62.46	62.46	56.04	42.99
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
• Revised.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$40.50	$40.50	$40.00	$32.25
Heavy melt'g steel, Phila.	*42.50*	45.50	40.50	31.00
Heavy melt'g steel, Ch'go	39.50	39.50	39.50	29.75
No. 1, hy. comp. sheet, Det.	35.50	35.25	35.00	27.00
Low phos. Young'n	47.75	47.75	47.25	34.25
No. 1, cast, Pittsburgh	56.75	56.75	54.50	40.50
No. 1, cast, Philadelphia	59.00	59.00	55.50	44.50
No. 1, cast, Chicago	69.50	69.50	63.50	44.25
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$8.75
Foundry coke, prompt	14.00	14.00	14.00	8.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	19.50
Copper, Lake Conn.	21.625	21.625	21.625	19.625
Tin, Grade A, New York	94.00	94.00	94.00	70.00
Zinc, East St. Louis	12.00	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	12.80
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	37.67	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.25

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Jan. 27, 1948	3.18925¢ per lb.	$40.17 per gross ton	*$40.83* per gross ton
One week ago	3.18925¢ per lb.*	$40.08 per gross ton	$41.33 per gross ton
One month ago	3.18925¢ per lb.	$37.98 per gross ton	$40.00 per gross ton
One year ago	2.87255¢ per lb.	$30.15 per gross ton	$31.00 per gross ton

*Corrected

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1948	3.18925¢ Jan. 13		$40.17 Jan. 29	$39.58 Jan. 6	$41.83 Jan. 20	$40.00 Jan. 6
1947	3.18925¢ Aug. 12	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

UNIVERSITY OF MICHIGAN LIBRARIES

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Delivered Los Angeles; add ½¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. Some producers charge (18) $2 more. (19) $1 more.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Franc'co. Los Angeles, Seattle	DELIVERED TO Detroit	New York	Philadelphia
INGOTS															
Carbon, rerolling	($36.00 f. o. b. mill) (Spot market as high as $86 to $90 gross ton)														
Carbon, forging	$46.00														
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS															
Carbon, rerolling[17]	$45.00[18]	$45.00[18]	$45.00[18]	$47.00	$45.00[18]	$45.00[18]							$48.20[18]		
Carbon, forging billets	$55.00	$55.00	$55.00	$55.00	$55.00	$55.00							$58.20		
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)								
SHEET BARS							Subject to negotiation								
PIPE SKELP	2.60¢[19]						2.60¢[19]								
WIRE RODS	2.80¢[19]	2.80¢[19]		2.80¢[19]	2.85¢		(Worcester = 2.90¢[19])					3.52¢[13]			
SHEETS															
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢		(Ashland, Ky. = 2.80¢)		3.54¢[16]	2.96¢	3.148¢	3.040¢
Cold-rolled[1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.71¢	4.00¢	4.016¢
Galvanized (10 gage)	3.95¢	3.95¢	3.95¢		3.95¢		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.62¢[16]		4.298¢	4.190¢
Enameling (12 gage)	3.95¢	3.95¢	3.95¢	3.95¢			3.95¢		4.05¢	3.95¢			4.11¢	4.466¢	4.406¢
Long ternes[2] (10 gage)	4.05¢		3.85¢											4.566¢	4.506¢
STRIP															
Hot-rolled[3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[16]	2.96¢	3.316¢	3.256¢
Cold-rolled[4]	3.55¢	3.65¢	3.65¢	3.55¢			3.55¢			(Worcester = 3.75¢)			3.71¢	4.066¢	4.006¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.616¢	
TINPLATE															
Cokes, 1.50 lb[5], base box	$6.80	$6.80	$6.80		$6.90			$6.90	$6.90	(Warren, Ohio = $6.80)				$7.248	$7.140
Electro, box 0.25 lb	Deduct $1.00 from 1.50 lb coke base box price.														
Electro, box 0.50 lb	Deduct 80¢ from 1.50 lb coke base box price.														
Electro, box 0.75 lb	Deduct 60¢ from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING															
55 lb to 70 lb	Deduct $1.60 from 1.50 lb coke base box.														
75 lb to 95 lb	Deduct $1.70 from 1.50 coke base box.														
100 lb to 128 lb	Deduct $1.60 lb from 1.50 lb coke base box.														
BLACKPLATE, h. e. 29 ga[11]	4.75¢	4.75¢	4.75¢		4.85¢			4.85¢	4.85¢					5.198¢	5.090¢
BARS															
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢[16]	3.06¢	3.35¢	3.356¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢[16]		3.098¢	2.990¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.71¢	4.00¢	4.006¢
Alloy, hot-rolled	3.30¢	3.30¢	3.30¢			3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)							3.432¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢			(Canton = 4.10¢)						
PLATE								(Coatesville = 3.45¢, Claymont = 3.65¢, Geneva, Utah = 3.10¢)							
Carbon steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	2.95¢				3.838¢[14]		3.298¢	3.190¢
Floor plates	4.20¢	4.20¢												4.716¢	4.656¢
Alloy	3.80¢	3.80¢	3.80¢		(Coatesville = 4.80¢)									4.316¢	4.256¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)					3.43¢[10]		3.040¢	2 932¢
SPRING STEEL, C-R															
0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9]															
Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56¢[13]		4.022¢	4.006¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)							5.737¢[13]		5.072¢	4.964¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.756¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt, Beth.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co		Base per lb
18	4	1	—	—	....	82¢
18	4	1	—	5	....	$1.29
18	4	2	—	—	....	93¢
1.5	4	1.5	8	—	....	59¢
6	4	2	6	—	....	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb	$2.75
Angle splice bars, 100 lb	3.85
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$3.10

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.65¢
Tie plates, Pittsburg, Calif.	3.80¢
Track bolts	7.00¢
Track bolts, heat treated, to railroads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, St. Louis, Kansas City, Minnequa, Colo.; Birmingham; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville	24.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham, Duluth

	Base per keg	Delivered San Francisco
Standard & coated nails	$4.75†	$5.33
Galvanized nails‡‡	4.75†	5.03
Cut nails, carloads, Pittsburgh base	6.30*	....

† 30¢ additional at Worcester. ‡‡ Plus $2.50 to $3.00 per 100 lb galvanizing extra. * Less 20¢ to jobbers.

	Base per 100 lb	
Annealed fence wire	$4.20‡	$5.21
Annealed galv. fence wire	4.65‡	5.66

‡ 10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column	
Woven wire fence*	100	114
Fence posts, carloads	105††	...
Single loop bale ties	99	115
Galvanized barbed wire**	113	121
Twisted barbless wire	113	...

* 15½ gage and heavier. ** On 80-rod spools in carload quantities. †† Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized	....	5.85	....	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

UNIVERSITY OF MICHIGAN LIBRARIES

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
⅛-in.	50½	34½
¼-in.	53½	38½
1-in.	56	41½
1¼-in.	56½	42
1½-in.	57	42½
2 in.	57½	43
2½ and 3-in.	58	43½
Wrought Iron, buttweld		
⅛-in.	+ 7	+29
¼-in.	2½	+19
1 and 1¼-in.	8	+11
1½-in.	13½	+ 7½
2-in.	14	+ 7
Steel, lapweld		
2-in.	49	34
2½ and 3-in.	52	37
3½ to 6-in.	54	39
Steel, seamless		
2-in.	48	33
2½ and 3-in.	51	36
3½ to 6-in.	53	38
Wrought Iron, lapweld		
2-in.	5½	+14½
2½ to 3½-in.	8	+10½
4-in.	12	+ 5
4½ to 8-in.	10	+ 6½

Extra Strong, plain ends

Steel, buttweld		
⅛-in.	49½	35
¼-in.	53½	39
1-in.	55½	42
1¼-in.	56	42½
1½-in.	56½	43
2-in.	57	43½
2½ and 3-in.	57½	44
Wrought Iron, buttweld		
⅛-in.	+ 2½	+23
¼-in.	3½	+17
1 to 2-in.	13	+ 7
Steel, lapweld		
2-in.	48	34
2½ and 3-in.	52	38
3½ to 6-in.	55½	41½
Steel, seamless		
2-in.	47	33
2½ and 3-in.	51	37
3½ and 6-in.	54½	40½
Wrought Iron, lapweld		
2-in.	8½	+11
2½ to 4-in.	17½	+ ½
4½ to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

		Seamless		Electric Weld	
OD in in.	Gage BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$16.67	$19.99	$16.17	$19.39
2½	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3½	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

CAST IRON WATER PIPE

Per net ton

6-in. to 24-in. del'd Chicago $91.12
6-in. to 24-in. del'd New York 89.18
6-in. to 24-in., Birmingham 79.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less 105.90

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

Percent Off List

½ in. & smaller x 6 in. & shorter ... 45
9/16 & ⅝ in. x 6 in. & shorter 46
¾ in. & larger x 6 in. & shorter 43
All diam, longer than 6 in. 41
Lag, all diam over 6 in. long 44
Lag, all diam x 6 in. & shorter 46
Plow bolts 54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller 43
9/16 to 1 in. inclusive 42
1⅛ to 1½ in. inclusive 40
1⅝ in. and larger 35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
½ in. through 1 in.	..	44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate ..... 65 and 10
In bulk 75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets (½ in. and larger)

Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $5.65
F.o.b. Lebanon, Pa. 5.80

Small Rivets (7/16 in. and smaller)

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 55

Cap and Set Screws

(In packages) *Percent Off List*

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright 53
¾ to 1 in. x 6 in., SAE 1035, heat treated 44
Set screws, oval points 56
Milled studs 29
Flat head cap screws, listed sizes... 16
Fillister head cap, listed sizes 37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer $5.95
Old range, nonbessemer 5.80
Mesabi, bessemer 5.70
Mesabi, nonbessemer 5.55
High phosphorus 5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDER

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh ..... 24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh ..... 30⅝¢ to 34⅝¢
Copper, reduced, 150 and 200 mesh ..... 30½¢ to 32¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots... 10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags.. 7.4¢ to 8.5¢
Domestic sponge iron, minus 48 mesh ..... 10¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots ..... 5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots ..... 63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe... 44¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe..... 39½¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe ..... 90¢ to $1.75
Aluminum, 100, 200 mesh, carlots ..... 23¢ to 29¢
Antimony, 100 mesh ..... 44¢
Cadmium, 100 mesh $2.00
Chromium, 100 mesh and finer... $1.025
Lead, 100, 200 & 300 mesh 20½¢ to 25½¢
Manganese, minus 325 mesh and coarser ..... 59¢
Nickel, 100 mesh ..... 51½¢
Silicon, 100 mesh ..... 29¢
Solder powder, 100 mesh.. 8½¢ plus metal
Stainless steel, 302, minus 100 mesh 75¢
Tin, 100 mesh ..... 90¢
Tungsten metal powder, 98%-99%, any quantity, per lb..... $3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.. $2.65
Under 100 lb $2.90

COKE

Furnace, beehive (f.o.b. oven) Net Ton
Connellsville, Pa. ..... $12.00 to $13.00
Foundry, beehive (f.o.b. oven)
Connellsville, Pa. ..... 13.50 to 14.50
Foundry, Byproduct
Chicago, del'd $18.60
Chicago, f.o.b. 17.50
New England, del'd 19.75
Seaboard, Kearney, N. J., f.o.b.. 17.85
Philadelphia, f.o.b. 17.75
Swedeland, Pa., f.o.b. 17.75
Buffalo, del'd 20.15
Ashland, Ohio, f.o.b. 15.50
Painesville, Ohio, f.o.b. 16.60
Erie, del'd 19.95
Cleveland, del'd 17.90
Cincinnati, del'd 18.59
St. Louis, del'd 18.03
Birmingham, del'd 15.76

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Carloads, Per 1000

No. 1 Ohio $67.00
First quality, Pa., Md., Ky., Mo., Ohio 73.00
First quality, New Jersey 78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio 67.00
Sec. quality, New Jersey 70.00
No. 2 Ohio 59.00
Ground fire clay, net ton, bulk 10.50

Silica Brick

Pennsylvania and Birmingham $73.00
Chicago District and Alabama 82.00
Silica cement, net ton (Eastern) .. 12.50
East Chicago 13.50

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Plymouth Meeting, Chester $64.00

Magnesite Brick

Standard, Balt. and Chester $86.00
Chemically bonded, Baltimore 75.00

Grain Magnesite

std. ⅜-in. grains

Domestic, f.o.b. Balt. and Chester in bulk, fines removed $51.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines 27.00
in sacks with fines 31.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢.. $11.95

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.51	$5.73	$5.76	$4.83	$5.68	$4.86	$4.57	$4.88	$5.58	$8.37	$8.67	$10.13	$10.28
New York	4.76	5.78[1]	6.18	5.59	5.92	5.11	4.78	5.08	5.63	8.58	8.73	10.18	10.33
Boston	4.82	5.89[12]	6.22[10]	5.12	6.80	5.17	4.87	5.04	5.69	8.82	10.47	10.24	10.39
Baltimore	4.33	....	5.73	4.81	....	4.78	4.73	4.86	5.56	....	....	....	....
Norfolk	4.80	....	....	5.20	....	5.05	5.05	5.10	5.90	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee	4.457	5.307[1]	5.857	4.557	5.657[5]	4.808	4.607	4.608	5.307	8.407	8.507	9.657	9.757
Cleveland	4.25	4.95	5.78	4.52	5.00	4.60†	4.65	4.40	5.10	8.33	8.43	9.30	9.49
Buffalo	4.25	5.10	6.05	5.25	5.70[5]	5.00	4.40‡	4.40‡	5.10	8.20	8.35	9.50	9.65
Detroit	4.35	5.20	6.02	4.72	5.63	4.88†	4.77	4.50	5.22	8.50	8.60	9.73	9.78
Cincinnati	4.51	5.19	5.74	4.74	5.70	4.95	4.79	4.75	5.45	....	....	....	....
St. Louis	4.61	5.46[1]	5.87	4.71	5.87	4.96	4.76	4.76	5.52	8.57	8.67	9.82	9.92
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.20	8.37	9.50	9.65
St. Paul	4.63	5.48[1]	5.88[2]	4.73[7]	....	4.93[7]	4.78[7]	4.78[7]	5.91[6]	....	....	....	....
Omaha	5.262	....	6.662	5.362	....	5.612	5.412	5.412	6.112	....	....	....	....
Indianapolis	4.553	5.324	5.874	4.653	5.753	4.903	4.703	4.703	5.403	....	....	....	....
Birmingham	4.45[11]	....	5.65	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.04	....	....	....	....
Memphis	4.82[11]	5.87[1]	6.37	5.02[11]	....	5.17[11]	4.97[11]	4.97[11]	5.87	....	....	....	....
New Orleans	*4.99[11]	6.28[1]	....	5.19[11]	....	5.34[11]	*5.04[11]	*5.14[11]	6.28[6]	....	....	....	....
Houston	5.30	....	6.60	5.25	....	5.35	5.15	5.30	6.80	9.40[17]	9.20[17]	10.35[17]	10.45[17]
Los Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7.35[14]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
San Francisco	5.40[8]	6.65	6.85	5.75[8]	....	5.50	5.20	5.05	7.5010	9.55[15]	9.35[15]	10.95[15]	11.05[15]
Seattle	5.45[4]	7.25[2]	6.85	5.60[4]	....	5.60[4]	5.25[4]	5.45[4]	7.45[14]	....	8.55[16]	....	11.15[16]
Portland	5.30[4]	7.10[2]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

‡ Add 40¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	40.00	40.50	41.00	41.50	.....
Birmingham	38.88	38.38-39.38	.....	.....	.....
Buffalo	40.00-42.50*	40.00-43.00*	40.50	.....	.....
Chicago	38.50	39.00	39.50	40.00	.....
Cleveland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....
Duluth	39.00	39.50	40.00	40.50	.....
Erie	38.50	39.00	39.50	40.00	.....
Everett		45.00	45.50	.....	.....
Granite City	39.50	40.00	40.50	.....	.....
Neville Island	39.00	39.50	39.50	40.00	.....
Provo	39.00	39.50	.....	.....	.....
Sharpsville	39.00	39.50	39.50	40.00	.....
Steelton	40.00	.....	.....	.....	46.00
Struthers, Ohio	39.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	38.50	39.00	39.50	40.00	.....
Troy, N. Y.	.....	.....	.....	.....	46.00
Youngstown	39.00	39.50	39.50	40.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.78	45.78	.....	.....	.....	51.78
Brooklyn	Bethlehem	3.60	43.60	44.10	44.60	45.10	.....
Cincinnati	Birmingham	5.85	44.73	42.23-45.23	.....	.....	.....
Jersey City	Bethlehem	2.21	42.21	42.71	43.21	43.71	.....
Los Angeles	Provo	7.13	46.13	46.63	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	41.06-42.31*	41.56-42.81*	42.06-43.31*	42.56	.....
Philadelphia	Bethlehem	2.00	42.00	42.50	43.00	43.50	.....
Philadelphia	Swedeland	1.21	46.21	46.71	47.21	47.71	.....
Philadelphia	Steelton	2.59	42.59	.....	.....	.....	48.59
San Francisco	Provo	7.13	46.13	46.63	.....	.....	.....
Seattle	Provo	7.13	46.13	46.63	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	40.25	40.75	41.25	.....	.....

* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$49.50; f.o.b. Buffalo—$50.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $55.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $62.46. High phosphorus charcoal pig iron is not being produced.

UNIVERSITY OF MICHIGAN LIBRARIES

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk) $145
Less ton lots (packed) 189.00
Delivered Pittsburgh 151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk ...	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots ...	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b. Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk 32
L.c.l. lots 34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads 32
Ton lots 34
Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk 7.80
Ton lots 9.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet 8.75
Ton lots 10.35
Less ton lots 11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe..	16.90	17.50	18.10
97% Si, 1% Fe..	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk ...	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots ...	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4.9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	18.60	19.00	19.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk ...	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots....	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots ...	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots ...	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C. ..	97.00	98.50	99.75
0.50% max. C. ..	93.00	94.50	95.75
9.00% min. C. ..	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe r 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots ...	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots $1.85	$2.70	$3.40
Less ton lots 2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-500% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots ...	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots ...	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed... $2.25

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth $2.90
Crucible 3.00
High speed steel (Primos) ... 3.10

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2 ..... $1.20

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb

Ton lots $2.50
Less ton lots $2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 95¢

Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo..... 80¢

Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo..... 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti $1.22
Less ton lots $1.25

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti $1.35
Less ton lots $1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton....$142.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton $65.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Carload lots ..... 18.40¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy

Carload, bulk ..... 6.00¢

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload ..... 6.90¢
Ton lots ..... 7.40¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Car lots ..... 9.50¢
Ton lots ..... 10.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

Eastern	Central	Western
$1.20	$1.23	$1.21

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots ... $1.89	$1.903	$1.935
Less ton lots 2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots..$1.80 $1.8125 $1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots ..... 39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1 ..... 93¢
No. 6 ..... 63¢
No. 79 ..... 45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.

Ton lots, per pound ..... 8.0¢

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B..... $6.25

Commerce Sets 125,000 Tons of Tinplate As Quarter Export Quota

Washington

• • • **The Dept. of** Commerce has established a second quarter export quota of 125,000 tons of tinplate, representing a reduction of 17,000 tons from the quota for the first quarter.

Commerce told the Tinplate Industry Advisory Committee last week that foreign orders for 112,000 tons of the total to be used for food preservation will be supported by CXS ratings and that such orders must still be accepted by the mills. The rated quota is a reduction of 8000 tons from the first quarter figure.

Of the 13,000 tons to be licensed on a nonrated basis, 5000 tons would be for packing abroad food to be imported into the United States. The remaining 8000 tons would be for uses permitted by the tin conservation order M-43, and for use abroad by American petroleum companies.

Licenses for these 8000 tons would be restricted to electrolytic tinplate (maximum 0.50 lb coating) or special coated manufacturing ternes. It was pointed out that this 13,000 tons reflects a further reduction for export of 9000 tons, from the level of the first quarter 1948 figure.

The total export quota of 125,000 net tons for the second quarter 1948 thus represents a total reduction of 17,000 tons from the level of 142,000 tons established for the two preceding quarters.

It was brought out in discussions that the Office of International Trade, after careful screening of foreign requests for tinplate, found that a minimum of 174,644 net tons would be needed in the second quarter of 1948 to preserve perishable foods alone, and that other essential needs would call for an additional 27,000, or a total of 201,694 net tons. In view of existing plans to conserve tin in the United States for stockpiling purposes, together with continued heavy domestic demand, the department said it would not be possible to license export of such quantities.

In reviewing the tin situation, Erwin Vogelsang, Chief of the Office of Materials Distribution's Tin and Antimony section, pointed out to the committee that, according to present estimates, the supply and restricted demand for the first half of the year 1948, at least, would be approximately in balance.

In view of the tin conservation program announced by the department, to be formulated after the affected industries report on the proposals, and which has as its ultimate object an increase in the strategic stockpile of the United States, a reduced quantity of tin will be allocated to the tinplate industry during the second quarter. Reasons for the coming reduction are two: (1) Anticipated saving to be effected by the conservation program and (2) the saving of tin to be made in the export program.

Country allocations of the 112,000 tons for the second quarter of 1948 are as follows:

Latin American Countries

Country	*Quota*
Argentina	8,500
Bolivia	250
Brazil	10,000
Chile	3,500
Colombia	800
Costa Rica	23
Cuba	4,500
Dom. Republic	115
Ecuador	75
Guatemala	50
Haiti	0
Honduras	25
Mexico	3,200
Nicaragua	35
Panama	50
Paraguay	150
Peru	1,100
El Salvador	25
Uruguay	1,300
Venezuela	750

Non-Latin American Countries

	Quota
Australia	11,400
New Zealand	1,800
South Africa	7,000
Southern Rhodesia	100
Middle East	1,500
Turkey	1,000
Philippines	1,700
French North Africa	3,500
France	3,500
China	2,000
Belgium	1,000
Denmark	2,100
Norway	4,800
Netherlands	9,500
Italy	2,500
Trieste	70
Japan	700
Portugal	3,200
Spain	500
Sweden	3,400
Switzerland	3,200
Madagascar	670
Eire	300
Greece	1,200
Newfoundland	25
India	2,500
Malaya (St. Settlements)	400
New Caledonia	50
French Equatorial Africa	25
Indo-China (French)	450
Iceland	250
French West Africa	250
Netherlands East Indies	1,000
Hong Kong	175
Portuguese West Africa	150
Belgian Congo	125
Jamaica	25
Siam	25
Contingency for other destinations	2,462
Total	112,000

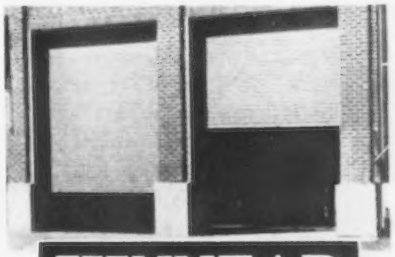
STOP Efficiency Loss at Doorways

● Plant efficiency often bogs down at doorways without letting you know it. Costs pile up while vehicles wait for doors to be opened. Time and labor is lost when busy employees open or close doors. Heating and air-conditioning costs soar when doors aren't closed promptly.

You can put a quick stop to these profit leaks by installing Kinnear Motor Operated Rolling Doors.* With a touch of a button, you raise or lower these doors at a second's notice—from any number of convenient points. They open straight upward and coil compactly above the lintel; all floor and wall space is *fully usable* at all times. The opened doors stay overhead, safe from damage by wind or vehicles. Their rugged, all-steel construction assures longer wear, lower maintenance, extra protection against fire, theft, and storm damage.

Keep door efficiency in step with the rest of your plant; call your Kinnear representative, or write us today, for full information on Kinnear Rolling Doors.

**Manually operated Kinnear Rolling Doors also available.*



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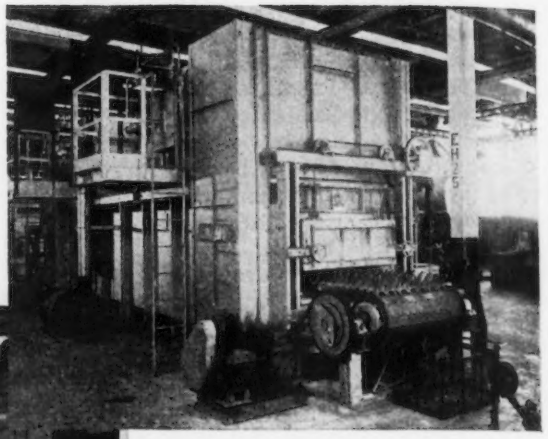
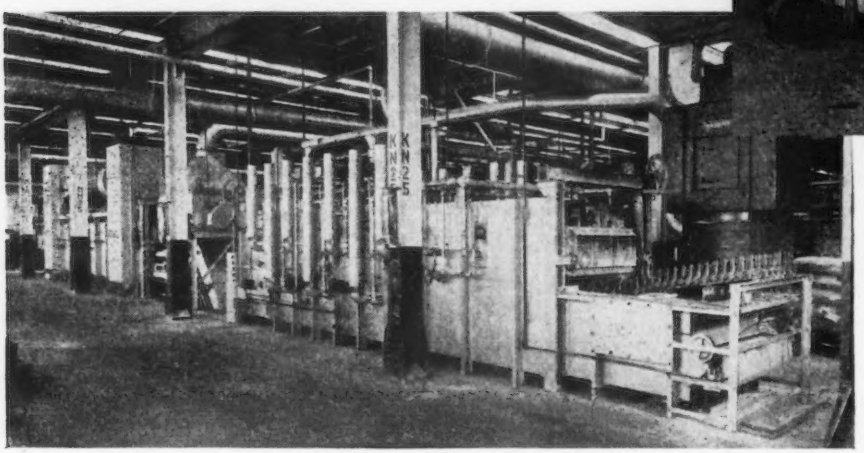
R-S FURNACE FACTS

ISSUED MONTHLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH QUALITY HEATING OF METALS

New R-S Furnace Installation in Mid-West Automobile Factory

This new R-S Furnace is a Harden-Quench-and-Draw unit for the heat treatment of miscellaneous steel forgings. The hardening furnace is a continuous belt conveyor type, radiant tube gas-fired, and operates with a controlled atmosphere. The work goes directly into the quench-tank onto a continuous slat conveyor which automatically delivers it to the draw-furnace conveyor.





The Draw Furnace is of the forced convection type and gas-fired. Production is one ton per hour.

Upper picture shows view of the continuous line at the discharge end; lower picture at the charging end. Automatic temperature controls with approved safety features are incorporated in the design.

At a heat treating plant in Lapeer
Was a furnace which acted most queer.
Said the boss, "I confess
Had I bought an R-S
Of all maintenance we should be freer."

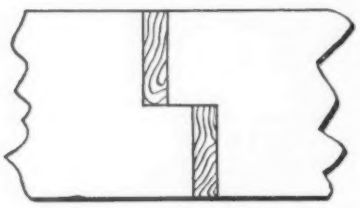
For the sake of the rhyme we have implied that burdensome maintenance is unusual. The plain truth is that it is commonplace for furnace maintenance costs to run high. That is one of the reasons that Maintenance is so high in the Steel business. Maintenance is 3 times Profits according to A.I.S.E. figures. But that's for the entire industry. For those steel men using R-S furnaces it is lower; on some R-S Furnaces there has been virtually no maintenance for years of steady use. It pays to buy R-S.

JMLee P-AA1

All Furnaces must have Expansion Joints but...

Expansion joints in brickwork are common to all furnaces but even in such simple details R-S shows its unique superiorities of design.

DIRECTION OF EXPANSION

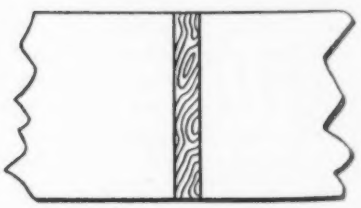


R-S

Note comparative sketches of R-S versus Usual design. The latter takes care of expansion but permits unrestricted heat flow through the joint material. This means loss of fuel, and possible damage to unprotected parts.

R-S design offsets the expansion joints so that the heat is bottled up and stays where it is needed. That's one of the reasons for the increased efficiency of R-S heat control.

DIRECTION OF EXPANSION



USUAL